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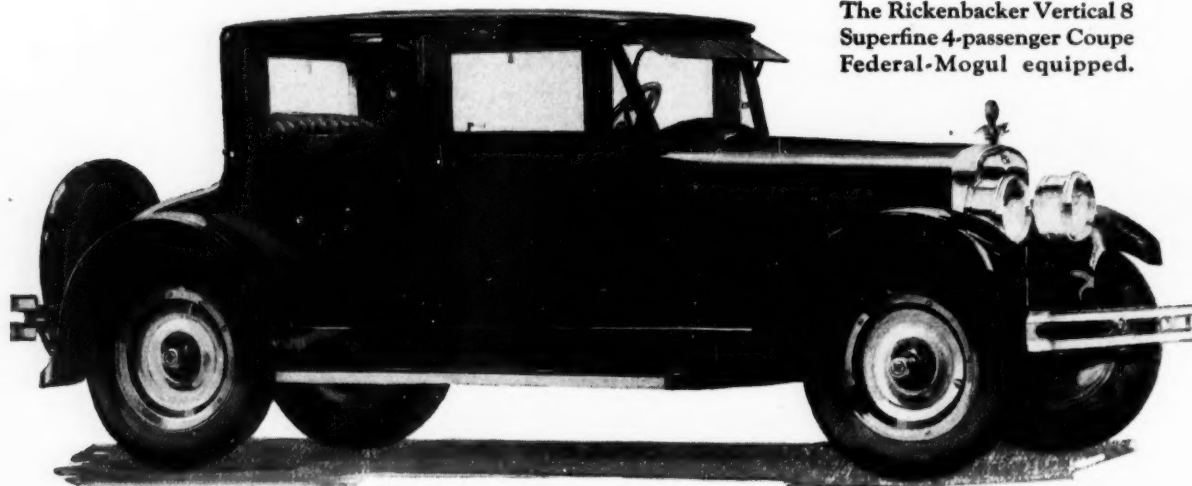
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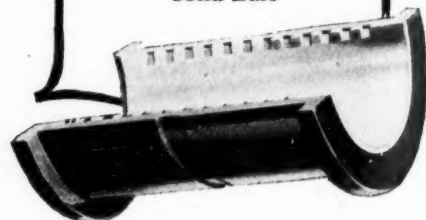
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No. 13

Good Prophets Boost Profits

Output trend curve shows rate of growth slowing up, but steady progress assured. Profits rather than volume form best basis for future production schedules.

By Norman G. Shidle

PROPHETS have been in difficulty ever since Moses began telling the Children of Israel about the Promised Land. Most of us are unwilling to believe. Yet modern business prophets have reduced the crystal gazing phase to a minimum and have concentrated on interpreting the future in terms of the past.

Cassandra, seeress of Troy, was doomed to have all her prophecies go unheeded because she broke a promise made to Apollo, who had bestowed upon her the gift of seeing into the future. Untold prophets since her time have been discredited, not because their predictions were altogether incorrect, but because they failed in some detail or date, sometimes of minor consequence.

But every automobile executive must look into the future. Part of his function is that of a seer whether he will or no. And the accuracy of his foretelling determines the dividends which his company will earn. Prophets build profits.

The old idea that prophets were born, not made, has been largely exploded in recent years. Modern business, which seized on the idea of training as the surest path to economic success, has proved that experience combined with

study of economics and statistics may make an excellent business prophet out of an executive who otherwise is equipped with just good common sense. That same common sense without the study, of course, would lead him more quickly to the goal of profits than would the study without the common sense, but a combination of the two is essential to the highest degree of commercial foresight.

FOR every automotive concern, whether it manufactures parts, accessories or completed vehicles, the problem of business prediction divides itself quite definitely into two parts. One part has to do with analysis of long swing movements. It involves the trend of the whole industry over a period of years and the reasonable future possibilities of the individual company as related to that general progress.

The other part relates to problems of the weeks and months immediately ahead and involves a constant series of predictions.

The two types of business analysis should be recognized as distinct. Too often in the past has the second kind been called upon to do duty in place of the first. This has caused considerable confusion in the industry and in particular plants

THIS is the second of a series of articles dealing with the most vital problem before the automotive industry today—"Profits vs. Volume." In the first article, which appeared in AUTOMOTIVE INDUSTRIES of Sept. 18, J. H. Collins told why the industry has been worshipping too long at the shrine of quantity production.

This discussion shows how plans can be laid with greater accuracy than in the past and points out that facts must have more weight than personal opinions if successful business prophesy is to be achieved.

because it resembles a good deal putting the cart before the horse. If the efforts of the company as a whole are not based on some sound long swing policy, its immediate efforts from day to day are almost certain to be hesitating, uneven and jumpy. Nobody expects a car driver, by careful manipulation of the accelerator pedal, to compensate for maladjustment in the carbureter, but something very similar is attempted when long swing planning is neglected and current analyses are expected to bear the entire burden of prophesy.

However unpleasant, it is necessary to predict the future. The automotive executive does it every time he buys a machine tool, every time he builds an extension to his plant, every time he sets a price, every time he buys materials, every time he hires an employee. Every time he performs any of the acts common to everyday business activity he is predicting the future. On the accuracy of his prediction depends the measure of his success. It is to his advantage, therefore, to utilize every orderly means available to help him in making his business guesses correct.

Past performances are of particular value in developing long swing trends. A normal curve, computed on the basis of car production over a period of twenty years, for example, if extended into the future will give some reasonable idea as to the probable rate of growth of the business in future years. Such a curve will not predict exactly the production of the industry for the coming year, but it will show very definitely that the rate of increase in automotive production is not going to be so great in the future as it has been in the past, but that peak production for a single year probably will be higher at several times in the future than it was in 1923, the year which now holds the production record.

Picture of Where the Industry Stands

These two facts are fundamental in the planning of business activities in any automotive company. They do not tell the manufacturer how many cars he can expect to build next year, but they do give him a picture of where the automotive industry stands now in its course of development.

But the long swing analysis, before it can be made effective, must be brought down to the conditions involved in the efforts of an individual company. This can be accomplished in much the same way as the course of the industry as a whole has been charted. Again the analysis developed should be dynamic in character. It should represent the position of the company at present as related to the past and to the probable future. The executive should know exactly what proportion of the total business his company did in each year of the past, should project his future probabilities on the basis of a similar trend, correlating them with the probable course of the industry as a whole.

"But," someone will say, "the Blank Company may do something tomorrow morning which will throw that calculation far out of the way. It may have been building a car which contained serious mechanical 'bugs.' It may scrap that car and bring out a really good model with fine body lines and excellent sales appeal. The new model may go over big. Then what happens to your predictions?"

The answer is, of course, that the predictions already made go awry. But that particular set of predictions will already have served their purpose if they showed the executives of the Blank Company where they would have gone had they continued their present model and policies and if it convinced them of the need of some radical change in methods if they were to be successful. Naturally it is necessary to get not only the positive side of the picture, but the negative side as well.

The next step would be for the Blank Company to bring its long swing analysis up to date, giving the one good year its place in company with the several bad ones, thus providing a basis for making a reasonable prediction of future progress provided their new policies are kept intact.

While it is easy to prove incorrect on occasions the predictions of a good many able automotive statisticians, there can be no question but that analysis of past production and registration figures has developed certain general

trends as regards automotive progress which form a sound basis for long swing planning. They show clearly that the industry has passed through the period in which its rate of increase in production was quite rapid and that the production curve in general will show a tendency to flatten out from now on. The general aspect of this curve will not be changed unless some very radical change, now unsuspected, comes in automotive construction.

A more detailed knowledge of these basic trends and of the relation of particular companies to the general trends will aid materially in stabilizing production, lowering merchandising costs and in increasing profits.

Once the general position of the company has been established and its relation to the industry as a whole is clearly in the mind of the executive, the ground is ready for development of scientific merchandising and manufacturing plans and for the organization of methods for short time planning. Every company, large or small, has to do a great deal of short time predicting and must keep in touch with current sources of information which will be useful in making them.

Short-term Planning

Long swing prophesies are essential to every kind of organization, but the small company has before it a much simpler problem in this regard than has the large one. While the sales problems of all organizations are much the same, the manufacturing problems of many of the smaller car and truck concerns are so simple as to depend on long swing planning to a relatively small extent. In the case of the car assembler, for example, the need for long swing planning as regards plant facilities and so forth devolves largely on the parts maker.

In current sales and merchandising work, as well as in current buying, the car assembler has practically the same problems, on a smaller scale, as has the big vehicle builder.

The first step in short swing planning is the attempt to determine how many cars the industry as a whole is likely to build in the next twelve months. The normal curve developed in connection with the long swing plans gives a basis for figuring. It does not tell in itself the

Next Week

ANOTHER article by J. H. Collins will tell the lessons learned by the automotive industry from 1920 to 1924 and will show how the knowledge gathered in the hard school of experience can be used to make the going easier in future years.

probable production for the coming year. It is useful simply as a foundation on which reasonable calculations can be built. It provides a starting point much nearer the actual figure than would be possible by mere guess work, and for this reason is useful.

Taking the normal curve figure as a basis, other factors must be considered before a final guess is made. Dealer stocks, general business conditions, manufacturers' stocks, the relation of actual to normal sales for several years past and other items of a similar character all can be obtained with a fair degree of accuracy. Then with his general knowledge and experience, coupled with this specific statistical information, the executive can make a reasonably good prediction as to total production during the coming months. Such a prediction is far more likely to be accurate than one which relies entirely on generalized knowledge and personal ideas.

Profits to the Fore

The probable position of the individual company can be determined in relation to that of the industry as in long swing planning. In both instances, however, *profits* should have more consideration as an influencing factor than has been customary.

Particularly should dealer profits be given weight when production schedules are being planned. The retail organization is the foundation of automotive marketing and its members must be given conditions under which it is possible for them to make money. A year of high production by manufacturers and low profits for dealers does not constitute a successful year for the industry. Dealer profits should have a very real influence on the production schedule of every individual manufacturer.

Once the tentative production schedule for the year has been set, the real work of selling and manufacturing begins. All of the preliminary planning is likely to go for naught if the watch of economic trends is discontinued at this point. Current conditions must be studied from day to day and from week to week in a specific as well as in a general way. Nearly all car manufacturers at present receive reports of sales from their dealers in various parts of the country. These reports are of great value in business planning when they are complete and accurate enough to form a basis for action. Considerable difficulty has been experienced in the past in getting the retailers to send in such reports promptly and to fill them out in detail. Every effort should be made to render the system of dealer reports complete and accurate.

Specific Cases

Here again, however, the relation of the individual company sales to those of the industry as a whole are essential if any constructive planning is to be possible. Thus far it has been extremely difficult to get anything like accurate figures as regards total retail sales from week to week. New car registrations can be bought, it is true, but these tell only a part of the story. The market for automobiles in a particular territory is not to be gaged by the market for new cars alone. The used car sales—

or lack of sales—are becoming a more important factor each year.

General Motors Corp. took a definite step toward making possible a better study of current trends when it began publication of its retail as well as its wholesale sales.

Where to Get Information

Other sources of useful information concerning current trends include:

1. General economic services which show the trends of business as a whole.
2. Monthly summary of automotive sales conditions in various parts of the country, together with the trend in the prices of raw materials used in the automotive industry. This information is included in the economic summary published in *AUTOMOTIVE INDUSTRIES* the first issue of every month.
3. Reports from factory traveling men.
4. Weekly trade paper reports of activities in various parts of the industry.
5. Trade association bulletins.
6. Export figures.

All of this information should be collected, analyzed and presented to the executive at stated periods. The executive should organize his system of collection and analysis on such a basis that he can have confidence in its reports when they are given to him. Having built up such a department, he should be influenced materially by the data which it gives to him. If he is going to give more weight to his personal opinion than to the specific data for the compilation of which he has paid real money, the expense so incurred has been unjustified.

While special methods may have to be devised to fit the needs of individual companies, the experience of successful executives over a period of years indicates rather clearly several things in connection with automotive business prophesies:

1. General trends of the industry can be determined closely enough for normal business planning needs by careful study of past performances. Plans of any individual company can best be laid out after a knowledge of these general trends has been obtained.

2. The general background forms an excellent basis upon which to make current plans and to determine policies for the immediate future.

3. Available information about business conditions must be *systematically*

collected and interpreted if an automotive concern is to operate economically over a long period of time. The fact that a lot of reports come into the plant means nothing in itself. The reports and statistics must be correlated and interpreted intelligently after they have been collected if they are to be worth the money spent in collection.

4. Prophesies have to be made. They can be made more accurately with the help of specific statistical data than is possible with only general ideas as a working basis.

5. Profits—not production schedules—should be the primary consideration in every phase of automotive business planning.

On Oct. 2

WILL appear an interview with one of the biggest executives in the automotive field in which he tells in a simple, practical, forceful way the methods he has used to bring his company through a period of depression with colors flying and sales moving at a normal pace. This is a story of how to run a successful automobile business by a man who is running one. Every executive will want to read it.



Buses leaving the engine and chassis maintenance station of the Fifth Avenue Coach Company. This was the first stop on a tour of inspection for members and guests

Coordination of Transport Agencies Advancing, S. A. E. Meeting Shows

Truck and bus are praised by railway executives at engineers' transportation sessions. Operators say that design of brakes, clutches and bodies should be improved.

THE commercial motor vehicle seems to have won its fight for recognition from the older transportation agencies. Three years ago almost any gathering which brought together motor truck men and representatives of the steam and electric railways would have resulted in innumerable arguments as to whether or not the motor vehicle had any rightful place in the transportation scheme.

The Automotive Transportation meeting of the Society of Automotive Engineers, held in New York, Sept. 18-19, showed clearly that differences of opinion now exist only as regards specific applications. It is generally agreed among railway executives that the truck and bus must be used if the public is to be given the service demanded by modern social and industrial requirements.

The only real tilt of the meeting, as a matter of fact, came—not through any denial on the part of railway men that the motor vehicle is essential to completion of their service—but over the statement of a truck company representative that the trolley car would be a thing of the past within a few years. But this statement and the argument following it constituted only an incident which did not reflect the general conclusions to be drawn from the sessions.

The meeting as a whole showed clearly that very considerable progress has been made since last year in the coordination of various transport agencies and

that among executives both in the truck and railway field there has grown up a very real spirit of cooperation and mutual understanding.

Many of the speakers were men in charge of bus and truck operating organizations and their comments on commercial vehicle design furnished considerable food for thought among the engineers and manufacturers.

Buses Should Meet Specific Needs

A plea was made by some operators for bus units specially adapted to the specific conditions under which they must operate, while others seemed willing to use the standard lines best adapted to their needs. One California operator is so strongly convinced that special units are necessary, however, that he definitely predicted that the large operating companies would start their own assembly plants unless the present manufacturers were willing to sell only those parts of chassis and bodies which actually can be used by particular operators.

Brakes, clutches and bodies were the design features which came in for the most criticism from both truck and bus operators. Several times the question was asked of operators, "With what parts do you experience the most difficulty from a service and maintenance standpoint?" In more than one case the

units mentioned were those named in reply. The difficulty seems to involve accessibility at least as much as performance.

Several attempts were made to get the operators to state their preference for six-cylinder or four-cylinder bus engines, but the opinions given were not

definite enough in any case to provide a basis for general conclusions.

The meeting was the second of its kind held by the Society of Automotive Engineers and was attended by about 200 men, nearly one-third of whom were from outside of the New York district.

Will the Motor Bus Replace the Trolley Car?

A. F. Masury meets with violent disagreement when he predicts the passing of electric lines. Number of spare buses needed questioned.

A. F. MASURY started something at the opening session of the S. A. E. Automotive Transportation Meeting when he stated that, "In five years trolley cars will not exist."

Mr. Palmer of the Baltimore Traction Co. rose and challenged his statement. He said that Mr. Masury did not mean exactly what he had said either about there being no street cars in five years or that the traction companies were without funds or ability to raise them.

Mr. Masury who is Chief Engineer of Mack Trucks, Inc., said among other things that he believed that passenger cars of the future costing more than \$3,000 would have six wheels and that for buses there would be six and eight. Referring to buses, he stated that it is cheaper to build a 6-cylinder engine than a good 4, that bodies will be developed of the non-rigid, articulated type, and that eventually they will have pressure ventilation inside rather than a vacuum which draws in dust and engine fumes.

V. E. Keenan, superintendent of the bus division of the United Electric Railways Co., of Providence, R. I., said that certain makes of buses have proved to be considerably more expensive to operate than other units and that, consequently, the selection of equipment is of first importance. He added that the chief trouble with present day buses lies with clutches and brakes and that what is needed are larger buses which are simpler to maintain.

J. B. Stewart, Jr., said that in his experience with buses with the Youngstown Ohio Municipal Railway he has found it necessary to have one spare for every five buses operated. Someone questioned the fact that so many spares were required. He replied that to maintain adequate service one spare for every five buses was what they had found they needed.

Buses Prove Worth in Providence Service

SPEAKING on "Public Utility Experience with the Motor Coach," Mr. Keenan said in part:

Within the next few weeks approximately 16 per cent of the electric-railway mileage in Providence will be abandoned and motorbuses will be substituted.

This mileage does not pay the net cost of electric operation. By net cost of operation, we mean that such items as cannot be directly charged to the operation of the unit, but can be charged to the volume of the business, have been eliminated. As a result of this elimination, we have arrived at a cost figure of 32.9 cents per electric car-mile. By substituting the net cost of motorbus operation, which in our case is 24.49 cents, it will be possible to effect an economy equal to the difference between these two costs.

Below is shown the division of revenue of the United Electric Railways Co. for the year 1923:

	Electric Car	Motorbus	Difference, Per Cent
Revenue	\$7,806,870.66	\$199,331.55	2.55
Mileage Operated	15,935,901	847,872	5.32
Revenue per Mile, cents.	48.90	23.51	48.10
Seating Capacity	52	25	48.10
Car-Hours Operated....	1,776,547.52	77,798.57	2.31
Average Speed, m.p.h....	8.99	10.87	
Investment	\$25,898,149.80	\$304,043.89	1.17
Revenue Obtained for Investment, per cent..	3.01	65.5	

To make the motorbus show a substantial net earning ability, a greater number of seats must be supplied. In our particular case, the field for double-deck operation is limited; as a matter of fact, all our motorbuses are of the one-man single-deck type.

Our management feels very strongly that single-deck motorbuses should be built to carry a load equal to that of a single-deck car. Although this figure is closely related to street width and the ability of a vehicle to flow smoothly with the traffic, it is not outside the realm of possibilities that motorbuses seating 35 passengers will appear in the early future.

From the passenger's standpoint one development within the last 2 years has been most pronounced. Present-day equipment is being built that duplicates the riding-qualities, vision, comfort and acceleration of the better class of passenger car on the market. Though this development in comfort and acceleration has been most welcome, very little apparently has been done in the way of reducing the costs of operation.

As a result of our experience, we find vast differences in the cost of operating various makes of equipment. Externally and theoretically no reason exists for this differential. As a matter of fact, however, as evidenced by operation, great differences in cost do exist; and, although we do not advocate a complete abandoning of existing units by the various manufacturers, we respectfully submit the suggestion that more thought and attention be given to the following points:

Let the transportation industry operate larger vehicles with an opportunity for earning greater profits, and manufacture vehicles that are simpler to maintain so that the cost of operation may be reduced.

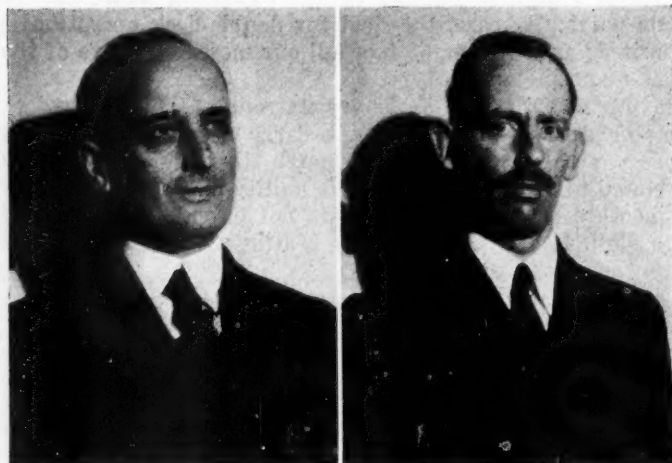
One cannot intelligently analyze the facts without realizing the enormous growth in the desire on the part of the public not only for transportation, but also for this type of vehicle. If the riding public actually desires to increase this growth further, the managements of the various mass-transportation companies will supply them.

Railway Executive Raps Bus Selling Methods

J. B. STEWART, Jr., General Superintendent of the Youngstown Ohio Municipal Railway talked on the "Operation and Maintenance of the Motorbus." He pointed out that the field of buses except for supplementary service lies in cities of less than 200,000 population and cited bus transportation service in Newburgh, N. Y. which supplanted street cars there more than a year and a half ago. Bus manufacturers, he said, concentrated on sales instead of supplying cars which would meet the widely different requirements of operators. Designs he stated needed to be simplified so that the part to be repaired would be accessible without removing many other parts. Excerpts from his speech follow:

No one would think of attempting to handle the transportation of a city as large as New York, Boston or Chicago with motorbuses or surface cars alone. On the other hand, subway or elevated transportation is not required in cities of 200,000 population. Personally, I do not believe that the motorbus can ever supplant an existing surface rail-car line that must serve an industrial section in a city of more than 150,000 population.

The motorbus has a very definite place in every city, regardless of size. It can be used to furnish limited-load service in large cities at a higher rate of fare than that



W. L. Bean, left, who talked on "Gasoline Railroad Cars for Branch Lines," and James Paterson, right, who spoke on "Distribution in London and Its Environs"

charged by rail-lines, as is now being done in New York City, Detroit, Chicago and St. Louis. A great number of persons can afford and are willing to pay a higher rate of fare for the special service rendered.

In a medium-size city, the motorbus can be used as a feeder to the existing rail-lines, the motorbus routes extending into newly developed territory that does not have a sufficient number of residents to warrant a rail extension.

In some cases it has been found desirable to remove the track and overhead construction at the time that the municipality repairs the street and to substitute motorbus service for rail-car service. A good example of this is Newburgh, N. Y., a city of some 30,000 people, where 22 motorbuses have been giving all the transportation service for 22 months.

In the electric-railway business, whenever a company desires to purchase new cars, or new equipment, such as

motors, controllers or air-compressors for new cars, or to replace similar equipment on existing cars, it sends out an inquiry for quotations to the several manufacturers furnishing such equipment, who, before quoting, will send either a technical representative or a data sheet to the prospective purchaser for the purpose of securing certain data.

The information requested is with regard to the length of the run, the schedule speed, the lay-over time at each end of the run, the number of stops per mile and per trip, the curves and the grades. It is practically impossible for a purchaser to secure any equipment unless he has furnished this information, the manufacturers taking the position that unless they know the kind of service in which the equipment is to be operated, and unless the equipment has been designed to operate under these conditions, it is not fair to ask them to guarantee the equipment and make good any failures.

Efforts Concentrated on Sales

My experience with the automotive industry has been that the entire effort thus far expended has been concentrated on the actual sale by salesmen, and that little or no effort has been put forth to study the conditions under which the motorbus is to operate.

I have heard of motorbuses being sold for use in inter-city service in which a speed of 30 m.p.h. had to be maintained for several hours, with a rear-axle ratio of 7.5 to 1.0. To anyone who has given the subject consideration, it will readily be seen that an engine would not long survive under the vibration that would be set-up at the engine speed necessary to operate the motorbus. On the other hand, I believe that many operators are unreasonable in their demands.

The varying load-conditions experienced in motorbus operation must also be kept in mind by the designer of brake-rigging to the end that as the load is added, the brakes will not tighten or loosen, as the case may be, because of the eccentric action of the brake pull-rods around the rear axle as the chassis frame rises or lowers under varying conditions of load.

One of the greatest advertisements and "passenger-getters" in motorbus operation, in my opinion, is a well-lighted motorbus.

It is my personal opinion that the battery should not carry any of the lighting load except for comparatively short periods of time when the engine happens to be shut-down. The sole function of the battery, therefore, is to carry the lights during these periods and to furnish current for the starting-motor.

In city service, with the numerous stops and slow-downs, it is rarely possible for the engine to operate for any length of time at a speed that will permit the generator to produce its rated output. It, therefore, becomes necessary either to introduce step-up gears or to design an armature that will produce the rated output at a lower engine-speed.

Our experience with many different makes of motorbus chassis has been that, although the parts may be well made and carefully assembled, they are assembled, so it seems to the operator, with the idea in mind that, once they are combined into a complete chassis, they will not have to be removed until the life of the chassis has ended and the chassis finds its way to the junk-yard. Cannot the designers help the operator by giving this subject their careful thought, to the end that, if a clutch goes bad, he can get it out in the minimum length of time and without having to take the transmission apart to get at the clutch?

Another maintenance problem comes to mind, that is,

the problem of relining rear-wheel brake-bands. At present, it is a rather extended task necessitating the removal of the wheel to get at the brake-band. It has always seemed to me that some scheme could be worked out for the rear-wheel brakes similar to that of the propeller-shaft brake-shoes, so that the shoes having worn-out linings could be removed and a new set installed without removing the wheels.

The tire problem has been solved by some operators, of which the company with which I am connected is one, through the medium of tire-mileage contracts. Under this plan, the operator does not own, service or repair any of the tires used on his motorbuses. The operator's duty consists only of keeping an accurate record of the miles operated by each motorbus and making a report to the tire company at the end of each month. The number of miles multiplied by the rate per bus-mile that has been agreed upon constitutes the charge for tire service.

Traction on pavements made slippery by rain, snow or ice presents a problem that has yet to be solved. Little or no difficulty is experienced on wet pavements by motorbuses equipped with dual rear tires, but a very small amount of snow will make the pavements so treacherous that no operator would care to risk the lives and limbs of his patrons by operating without some aid to traction.

From your experience with passenger cars, you will probably agree that an ordinary set of chains will last from 200 to 300 miles before the cross-links begin to break. A so-called de luxe type of chain will probably wear half as long again. When we stop to consider that a motor bus in regular service travels approximately 225 miles per day and averages 7.5 stops per mile, it will be apparent that the ordinary type of chain will last hardly through one day.

Place of Six Wheel Buses in Transportation

A. F. MASURY in his paper on the "Future Problems of Motorbus Engineering" brought out the fact that the average life of a bus was from four to five years. Better riding quality, he stated, has renewed the impetus of the six wheel bus, though the four wheelers fill definite requirements. The question of spring suspension, driving on two or four wheels, and breaking on front, four rear wheels, and driveshaft separately or collectively is still unanswered. Bodies need greater flexibility. Part of his paper is printed below.

One of the most important problems before the automotive engineer today is how to increase materially the useful life of a motor bus so that its depreciation can be reduced substantially. The average daily mileage covered by motor buses is 208 miles, representing a continuous operation of 16 hr. per day at an average speed of 13 m.p.h. Making a due allowance of 30 days for yearly overhaul and maintenance, the mileage covered per unit is approximately 70,000 miles per year. Now if we assume that 300,000 to 350,000 miles are sufficient to send a motorbus to the scrap heap, and many of them arrived there before reaching this figure, we are faced with a useful motorbus life of 4 to 5 years.

This rather short period of usefulness is an important item directly affecting operating costs.

Motorbus engineering has not yet reached the point where stabilized designs can be standardized and improved rather than changed. This is undoubtedly due to exacting demands for maximum comfort, safety and speed, together with economical operation demanded by operators.

This natural tendency toward better riding quality has renewed the impetus of the six-wheel bus. It does not mean, however, that the present four-wheel buses, having seating capacities of 25 to 30 passengers, will be displaced. Such will never be the case, as there is a very definite need and place for this type of motor vehicle and always will be. To supplant it with a large carrier would be against common sense economics.

From all appearances six and eight-wheel buses are proving their economic worth and filling specific needs. They must be essentially large carriers.

Use of two rear axles permits smaller axle units, thus increasing ground clearance and decreasing overall height and makes for lighter individual unsprung weight.



"When Does a Truck Become Obsolete?" was F. W. Davis's subject, left. A. F. Masury outlined the "Advantages of Six-Wheel Buses" at the Thursday morning session

Furthermore, when a wheel or the wheels of one axle roll over a bump, the rise of the sprung weight is only one-half that occasioned with the conventional design but the time taken to do it is the same in either case, therefore the velocity of drop of the sprung weight is halved. We know that the force of impact is $E = \frac{1}{2} MV^2$, then the body reaction and stresses thus induced are but one-fourth of those felt by the single axle type. It is this fundamental advantage of the dual rear axle construction that produces better riding quality.

Should the power be transmitted through the gears of the first axle to the second or should it be equally divided between each axle by a power differential? This latter unquestionably is a more expensive construction and perhaps limited to the larger vehicles, but it possesses advantages as in the case of different tire diameters on account of wear or other causes. By differentiating the power, driving members can be made lighter. A further improvement might include a power differential lock to prevent slipping.

Tractive Effort and Axles

To drive but one axle is commendable from the point of view of simplicity, but it reduces the tractive effort available. In conjunction with a flexible spring layout it is likely that the driving wheels occasionally will leave the road and cause engine racing, especially when rolling over what is termed "washboard" roads.

If we have brakes on all four rear wheels, should we also have front wheel brakes? It may be advisable, but is this complication offset by the gain? If the center of gravity is low, the shifting of weight toward the front when braking will be decreased,—furthermore, tests have



J. C. Evans, left, told how the Long Island R. R. is using trucks. J. A. Hoffman, center, and W. F. Banks, right, had a joint paper on "Essentials of a Successful Motor Haulage Organization"

proved that skidding is practically eliminated when braking on the four rear wheels of a six-wheel vehicle, even on wet and greasy smooth pavement. To obtain uniform braking, the point of power application should be at the center of the rocking plane of the suspension.

As the size and weight of motorbuses increase, human power becomes inadequate to efficiently apply the brakes, and recourse must be made to the servo mechanism. This brings up another question: should the servo mechanism operate a driveshaft brake in conjunction with front wheel brakes, or should it apply the wheel brakes only, reserving the driveshaft unit for emergencies?

As the wheelbase increases, steering must remain easy, and this may necessitate center point steering, possibly with the axis of the king pin in the plane of the wheel. To do this and have front wheel brakes at the same time on a large vehicle is a problem requiring considerable engineering skill, especially when it is considered that standard disk wheels have an outside diameter of 20 in.

Designing the Engine

In designing the engine a bore stroke ratio must be chosen that will not only comply with the characteristics a bus motor should have, but also combine maximum crankcase-front axle clearance with low overall height. We have heard a great deal for the past year about six-cylinder engines for bus work. Is this multiplicity of cylinders the ultimate solution? Personally, I am rather inclined to believe that it is not a matter of cylinder number but rather of performance.

Strange as it may seem, a six-cylinder engine is cheaper to build than a good four and it is a human trait always to choose the path of least resistance, but from an operating and maintenance point of view the four is far superior. A well designed four-cylinder engine can be made to equal the performance of the ordinary six.

In large sizes and for economy in production we may be forced to build the frame in two sections. If so, where should it be split? Loading and bending moment diagrams seem to indicate that the splitting line should be just ahead of the forward rear axle.

Should the frame be built to be flexible or provide the utmost rigidity possible? In the first place complete rigidity is mythical, and it is a case where we must strike a compromise between relative rigidity and excessive weight.

Body and frame design are directly linked, for if we are going to have a flexible frame we must build also a flexible body. On the other hand, if we choose a rela-

tively stiff frame, a super-rigid body will be necessary to reinforce the complete assembly. Perhaps a combination of the two is the solution! Duraluminum as a body material might be used advantageously, combining strength and lightness.

Looking at it from another angle, should we have a frame? We seem to have been guided in the past by motor truck practice. In this case a frame is necessary on account of the variety of bodies suited for different kinds of work, but in the case of the motorbus we have to deal almost exclusively with closed bodies of box-like structures. Why not build the assembly along lines somewhat similar to those adopted by Lancia with their smaller passenger cars? Let us go even further, build the body in sections joined together, thus simplifying service problems in case of accidents.

We see two distinct ways opened before us: the flexible type of bus chassis and body and the super-rigid assembly. Should the vehicle be designed as a simple beam or on the trussed bridge principle? In answering this question let us not forget the appearance of the finished product; its importance often has been underestimated.

Among the many problems of bus body design that remain to be solved satisfactorily are those of ventilation, heating, freedom from road dust, preventive methods needed to prevent the exhaust gases as well as engine compartment vapors from reaching the body and the elimination of noise in general.

"Dead Man" Control

To be successful in operation any common carrier must be safe. We have in trolley and subway work what is known as the "dead man" control. Cannot this be applied in motorbus work by devising safety appliances which will automatically apply the brakes in case of accidental loss of control by the driver?

Upon the solution of all these questions rests the future of the motorbus and whether the ultimate vehicle will have four, six or eight wheels, I would hardly dare prophesy. The greater manufacturing cost, the increase in total dead weight and the higher transmission losses are the price to be paid for more than four wheels. This may be offset by better riding quality, greater capacity, tire mileage and fuel economy obtained. Future experiments may show a reduction in maintenance also.

Let us not forget that the inherent flexibility of the motorbus is its greatest asset and that its future development is dependent in a large measure upon the progress of our highways and road design.

Railcar Design and Truck Haulage Topics at Joint Session

*James Paterson tells how terminal transportation problems
have been solved in England and W. L. Bean discusses railcars.*

THE Friday evening session was a joint meeting of the S. A. E. and the New York Railroad Club. It was held in the Auditorium of the Engineering Societies' Building and was well attended, the whole auditorium being filled. Two papers were read and discussed, one being on "Small Consignment Commodity Distribution in London and its Environs" by James Paterson, a member of a firm engaged in this business, and the other by W. L. Bean, assistant mechanical engineer of the New York, New Haven & Hartford Railroad, which dealt with recent developments in railcars.

Outlining the traffic conditions in London, Mr. Paterson said that the first movement of goods that arrive in London from overseas is generally by lighters to warehouses located on the water front, but that some of the warehouses are away from the river and these are served by truck. The movement of the goods coming in from the country is mostly by rail, but fruit, milk and the like are transported over the roads.

Bulk distribution from warehouses to retail stores is generally by road within a distance of 15 miles, gradually changing to rail as the distance increases. Meat and similar products are carried over the roads up to distances of 75 miles. Letter post, parcel post and the newspapers chiefly use the railroads. Delivery of goods from retail stores to customers is made over the roads, quick service and the advertising value of using their own trucks counting heavily with these stores.

Delivery Service Around London

The service specially dealt with in the paper is over the roads to a territory of nearly 4000 square miles in and around London. About 40 per cent of the packages handled weigh less than 15 lb., 20 per cent from 15 to 30 lb., and 40 per cent more than 30 lb. A few weigh more than 200 lb. The consignments usually consist of one package only. About 42 per cent of them contain food, groceries and tobacco; 33 per cent clothing and 6 per cent private baggage. Traders' goods and parcels of all sorts constitute the remaining 19 per cent.

Readers of AUTOMOTIVE INDUSTRIES probably will be interested chiefly in the types of vehicle used for this service. Horse vehicles and motor trucks of small capacity are used for collection and delivery, the trucks operating from what Mr. Paterson calls "sorting depots." The goods are transferred from these sorting depots to the depots from which they are delivered, by means of 4-ton motor trucks.

Collection of parcels in the towns is made generally by single horse wagons with ball bearings and light metal covers. Double horse wagons are being replaced by electric or gasoline trucks. Mr. Paterson said electric trucks appealed to Britishers because they preferred to use their spare cash to pay off their indebtedness to this country rather than for buying motor fuel here.

Two types of 4-ton trucks are used between depots. One of these, referred to in the paper as No. 1, was redesigned from a manufacturer's stock model which was found to be unnecessarily powerful for the work in hand.

Some trucks of this type that habitually draw trailers retained their original cylinders, but on others the cylinder dimensions were reduced and the constant mesh gears in the transmission were changed to give a lower engine speed for the same truck speed. This is a 35 hp. bevel gear-drive truck weighing 10,528 lb. and operating 5.8 miles per gal. of fuel. Front tires (solid) give 25,000 and rear tires 30,000 miles service.

Type 2 truck, of the same capacity, was built specially for this work, to give the maximum efficiency on good roads with few hills. This is a 24 hp. truck with chain drive. It weighs 8,372 lb., gives a mileage of 7.12 per gal., 26,000 miles service of front tires and 32,000 miles of rear tires. This truck is so designed that the units can be interchanged readily without taking the truck out of service.

Bodies on Various Types of Trucks

Types 1 and 2 have bodies of wood frame construction with steel covering. They are 13.5 ft. long, 6 ft. wide and 6.5 ft. high inside, and have doors at the back. Each weighs about 2000 lb. and has four eyes by which it can be raised from the chassis by means of a four-point suspension lift.

A transfer truck that comes into a depot passes under a lift by which its body is removed. Then it goes on, has a loaded body placed upon it and drives away at once. The loaded body that was removed is lowered onto a four wheel flat truck that is switched to the sorting platform. The trailers in use are flat trucks built of steel, with rubber tires, and they carry one of the removable truck bodies.

One type of delivery truck is built in three styles, viz., (a) to carry 2500 lb. at 18 m.p.h., using pneumatic tires; (b) to carry 3350 lb. at 12 m.p.h., using solid rubber tires and (c) to carry 4500 lb. at 10 m.p.h., using solid tires. The chassis parts are the same in each of these three styles but the engine speed, the gear ratios and the springs are different. The fast style is supplied to stores on a rental basis, while the two solid tire styles are used for country or suburban delivery.

One Ton Trucks

Type 4 is a Ford 1-ton truck and Mr. Paterson said if it were not what it is it would not have sold in millions. His company is trying to find a rival to it, built on the lines of its usual practice and made in four styles: a 1-ton truck, a traveler's car, a type for garage work and another for passenger use. Such a vehicle would have a four-cylinder engine and a three-speed gearbox in one unit, central control, a propeller-shaft to a worm or bevel drive, detachable steel wheels with pneumatic or cushion tires and a gilled-tube radiator. They want trucks to last 10 to 12 years in their work without having the repair bills become too high. They have more than 30 trucks of a type similar to Type 1 that were bought before 1911 and that are still doing good work; this at no depreciation expense, since they write off values in about 7 years.

Ideal Railcar Design Outlined by W. L. Bean

W. L. BEAN, assistant mechanical engineer of the N. Y., N. H. & H. R. R., presented a paper on "The Gasoline Railroad Car for Branch Lines." Mr. Bean, who is in charge of railcar development for the New Haven road, gave an outline of the requirements in this line. In order to reduce the operating cost, the weight per passenger and the engine power required (which depends upon it) must be kept down, and it will not do to be too liberal in space design. From this standpoint the placing of the engine under a hood, as in automobiles, is good practice, even though such a design may not be attractive to the railroad man's eye. Bulkheads dividing the car into several compartments should be as few as possible, because they add weight and interfere with the movements of passengers.

Except in the smallest cars, it may be assumed that few four cylinder engines will be used, as the amount of power required can be generated more advantageously in six cylinder engines, which are more quiet and flexible and operate more smoothly. The use of two smaller engines on one car does not seem a good plan.

Mr. Bean laid emphasis on the point that in railcar operation the power factor generally is a good deal higher than in road vehicles, and the tendency in railcar design now is to provide a larger power reserve. This assures longer engine life, lower maintenance cost and greater dependability. Excess engine power, on the other hand, is costly and unwarranted, and an intelligent choice should be made. The following table shows present practice in powering railcars:

Power Expended on Accessories

A certain amount of the engine power, from 10 to 12 per cent, is required for operating accessories such as the fan or blower, the air compressor, the electric generator and the pump. Quite a proportion of the power generated by the engine is lost in transmission, the efficiency of the hydraulic transmission system being set down by Mr. Bean at 69 per cent; that of the electric system at 72 per cent and that of mechanical transmission at 80 per cent. For usual conditions of grade and speed one brake hp. should be provided for from 300 to 400 lb. of loaded weight.

The transmission and control of the power continues

to constitute the chief problem of railcar design. Automobile type transmissions are still most popular, because of their low cost, low weight, simplicity and dependability, and also because the demand for remote control has not as yet been sufficiently insistent to do away with single end cars. Railroad men are unfamiliar with hydraulic gear-shifting and they will have to be "sold" on this system by railcar promoters. Electro-pneumatic control has had some attention but appears complicated.

Well designed automobile type transmissions have given good results in service. For instance, little attention has had to be paid to the transmission systems of three Mack railcars in use by the New Haven road which have covered an aggregate mileage of close to 250,000.

Most of the discussion of the evening centered around the paper on railcars. Charles O. Guernsey said that he fully agreed with Mr. Bean regarding the importance of light weight and of a proper ratio between weight and horsepower. He also wanted to emphasize the necessity for having at least 50 per cent of the total weight on the driving axles. It was his opinion, however, that the loaded weight-horsepower ratio was not a universal factor for performance, because of differences in operating requirements. He thought that on certain branch lines railcars would give satisfactory service with a lower weight-horsepower ratio than would be permissible in cars which have to operate on main lines.

Mr. Guernsey suggested another factor of performance, which he calls the traction effort delivered per ton moved. This is found by multiplying the open throttle engine torque at the engine speed corresponding to the car speed for which the calculation is made, by the mechanical efficiency of the transmission, by the maximum power factor, by the gear ratio and by the wheel radius. He applied this formula to the data presented in Mr. Bean's table and showed that this factor varied much less than the weight-horsepower ratio.

Another point brought out by Mr. Guernsey was that if a railcar is provided with two direct drives the higher of these can be made quite high, which will take care of the tendency of the engine to race when the car is descending a grade, which was referred to in the paper.

Chas. M. Manly said that he had had quite extensive experience in the development of hydraulic drives and he questioned the accuracy of the figure of 69 per cent efficiency given for this drive in the paper. In answer to Mr.

TABLE 1—ENGINE SIZES AND CAR WEIGHTS OF GASOLINE RAILCARS

Make of Car	Engine Rating, B.Hp.	Weight of Car, Lb.		Passenger Capacity	Loaded Car Weight Per Brake Horsepower, Lb.		Type of Drive
		Light	Loaded				
Brill 55	68	29,000	36,000	38	530		Gears
Mack AC	64	23,700	31,300	35	490		Gears
Mack AH	140	57,000	65,000	52	465		Gears
Brill, New Haven.....	150	41,000	49,800	50	332		Gears
Sykes, New Haven.....	150	35,500	44,550	45	297		Gears
Brill 65	150	34,000	41,000	38	274		Gears
Brill 75	250	50,000	61,800	50	244		Gears
Sykes, Chicago Great Western ²	225	39,000 ^a	45,800 ^a	30 ^a	203 ^a		Gears
		22,000 ^b	28,600 ^b	74 ^b			
		61,000 ^c	74,400 ^c	74 ^c	330 ^c		
New Haven, Hydraulic.....	170	52,800	64,100	60	378		Hydraulic
New Haven, Brill-Gen'l Electric	225	70,000	81,150	60	361		Electric
General Electric (Old Type)...	200	107,000	124,200	86	621		Old type electric

²Two-car train. ^aPower car. ^bTrailer. ^cTrain.

Manly's request for further information Mr. Bean said he had found the efficiency of the hydraulic transmission itself to be in the neighborhood of 82 per cent and that the figure of 69 per cent referred to the overall efficiency between the engine and the drive wheels.

A. J. Scaife of the White Motor Co. said his experience with hydraulic transmissions had been that the fluid was being circulated at a slow rate when the power required was great and vice versa, and that the efficiency of the system was therefore low.

One member of the audience thought Mr. Guernsey in his table had not made allowance for the air resistance, which with a standard car accounts for 90 hp. at 60 m.p.h., he said. The reply was that the formula for traction effort available showed what the engine was capable of delivering at the wheel rims and did not pretend to show what this traction effort was used for.

One of the railroad men present made the rather surprising statement that roller bearings caused greater loss of power than plain bearings at high speeds and that

they used roller bearings only because they reduced the starting resistance.

Discussing the Paterson paper, Mr. Williams of the New York Central said they had not found a solution of the store door delivery problem so far, because often they would receive, say, a carload of apples consigned to a man who upon investigation would be found to have an office on the twenty-seventh floor of the Woolworth Building but no other quarters. Too many people made their freight depot their principal place of business. Up to two or three years ago they had not used trucks to any extent, but they had now discontinued way freight service on the electric system and were using trucks with a distributing center at Yonkers.

Export freight is also being brought to steamship piers by means of trucks. This was formerly done by means of lighters but it was found that sometimes a lighter made the trip from Weehawken to South Brooklyn with a cargo consisting of a box of sausages weighing 210 lb. which might more profitably have been taken in a taxicab.

Operators Ask Greater Comfort and Lighter Weight in Bus Body Design

Close study of user's viewpoint urged. California bus companies consider establishment of own assembly plants, F. D. Howell says.

IMPROVEMENTS in bus body construction was the topic given most consideration at the second motorbus session of the transportation meeting. It was agreed in general that lighter and more comfortable bodies are needed, but it has been found that decreased weight often results in less durable construction.

Buses with low floor height and more attractive appearance have a decided advantage in earning power, partly because they are easier of access and partly because better entrance facilities permit more rapid loading with consequent shorter stops and a higher average speed.

Need for closer study of the user's viewpoint was urged by some speakers who also pointed out that it is unwise to attempt to force the sale of a vehicle not well suited to a given service simply to facilitate quantity manufacture of a single model. On the other hand it was pointed out that changes in chassis made in response to the ideas advanced by individual purchasers are exceedingly difficult from the manufacturing standpoint. According to A. J. Scaife, of the White Motor Co., who presided at this session, about the best the manufacturer can do in this regard is to secure a sort of composite picture of the needs of various purchasers and then build the bus accordingly.

Speaking from the large purchaser's and operator's standpoint, however, F. D. Howell, vice-president of the Motor Transit Co. of California, said: "The manufacturer must furnish that which can be used in service, or, if the need is so special that this is not feasible, he must be willing to sell only those parts that can be used, so that the purchaser will not be compelled to take off new wheels, springs or other items and replace them with those he needs, and in the meantime seek a market for the parts removed and accept a price much below their actual value."

If the transportation industry cannot get this service, said Mr. Howell, it will have to develop its own assembly plants and purchase parts from various manufacturers. "Some stage systems on the Pacific coast are so close to

this now that it would not take much additional investment to give them complete assembling plants, and it will depend on the manufacturers whether these assembly plants will grow, or whether the manufacturers themselves will meet passenger service, irrespective of whether the product can be used successfully."

Other portions of Mr. Howell's paper, which was presented in the absence of the author, contain comments and constructive criticisms which are of special interest to bus manufacturers and engineers. Some of these are given in the following extracts:

Bus Operator Outlines Desirable Design Features

INVESTIGATION of the service of freight and passenger carriers in California indicates that the passenger cars in common carrier service operate about twice the number of car miles per day covered by the common carrier freight cars, and three to four times the mileage of the cars of the ordinary contract freight hauler. Sixty thousand to 80,000 miles a year is about the mileage of individual cars in common carrier passenger service.

A car, well suited to local city service, similar to that offered by street cars, should have maximum seating capacity (say 28 to 30 passengers), with full-head-room for standing passengers, floor level as close to the ground as possible for ease in loading and unloading, entrance and exit on the forward right-hand side of the car, abreast of the operator or driver, with a centre aisle longitudinally along the centre line of the car. The operator should have control of loading and unloading of passengers, and the collection of fares, without leaving his seat, and for the collection of fares under 25 cents, the car should be equipped with recording fare boxes with a release of the money as collected to the operator after passing through the register. Pneumatic tires should be used, front and

rear, with dual tires in the rear, and all tires interchangeable.

In this service the average speed between terminals is 10 m.p.h., with a maximum of 15 to 20 m.p.h., the usual condition being such as to require preparations to stop at about the time the maximum speed is reached. The engine performance and transmission here require quick, smooth get-away and acceleration, minimum vibration,



H. W. Howard, transport engineer with G. M. C., left; Geo. E. Hallett, chairman of the meeting, center, and Hugh G. Bersie, engineer Haskelite Manufacturing Co.

and smooth action through gear changes. In this service, there is little chance to use over-drive, so that it is better left out.

For low grades and paved streets, engine power required is approximately 1 h.p. per passenger seat, S.A.E. rating, and 4-cylinder engine is preferred on account of maintenance expense. In city streets, high road clearance is not necessary, but short turning radius and 30-ft. length over all are necessary to handle satisfactorily around street corners. Wheel gage is immaterial. Some of the more popular models now used in this service, in California, at present are:

Make	Seating Capacity	Engine S.A.E. Rating	Wheel Base	Height Floor to Ground
Mack Int.	29	28.9 hp. 4 cyl. . .	230 1/2 in.	26 in. at front axle
Fageol. . .	29	Hall-Scott Engine 28.9 hp. 4 cyl. . .	218 in.	22 in.
White. . .	25	G.R. 28.0 hp. 4 cyl.	198 in.	30 in. front axle 36 in. rear axle

Local and Inter-city Service

For local and inter-city service conditions are the same, except that over-drive can here be used to advantage on the longer runs between stops; road clearance must be considered as must wheel gage, because reconstruction or repair of highways often detours traffic temporarily over unimproved roads which soon get cut up and rutted, and in wet weather would mire down the very low, under-slung models.

Through inter-city service the front entrance, centre aisle body is not a necessity, nor is the head-room required, as in the local bus. Side-door construction permits of minimum headroom, some models now in use having as low as 4 ft. 6 in. in the clear. The type of car most frequently used in this service is the side-door touring type, with long, racy lines, and a seating capacity from 18 to 26 passengers. This service requires a more comfortable seat than does the local car; on account of the long rides, it requires more leg-room, foot rests, deep cushions and soft back.

When street car type of bus is to be used in this

service, it requires greater head-room than does the side-door type, and generally is equipped with chairs, or heavily upholstered seats. This arrangement, made to afford more comfort for the passengers, reduces the capacity about 20 per cent. The average speed between the terminals in this service is 30 m.p.h., with a maximum of 35 m.p.h. The transmission and engine requirements are the same as for other service, over-drive being useful on low grades and paved roads. The horsepower required with occasional short grades not to exceed 4 or 5 per cent is 1 hp. per passenger seat, with a ratio of dead load to live load of 2 to 1, and on long grades up to 7 and 8 per cent and much curvature, with long distances, requiring speed cut to 15 or 18 m.p.h., the power required is approximately 1 1/2 to 2 hp. per passenger seat. Horsepower on grades depends, of course, on the grades and the speed to be maintained and must be great enough to carry the car at the maximum safe speed at all times. In inter-city through service the six-cylinder engine is preferred on account of greater flexibility.

The public demands a reasonable speed at all times, considering the character of the road being travelled, and no matter how steep the grades or how slow a car must travel to climb them, when that car is off the grade, the public demands immediate pick-up and continuation of the journey at normal speed. Many runs, involving from 50 to 100 miles of low grade line, then a climb into the mountains on 10 to 27 per cent grades on dirt roads, must have double reduction gears or compound transmission, if they would meet these requirements. Even though the standard equipment might make the grades, it would be too slow for comfort going up and would be unsafe to use because of the danger on the downhill trip, when entire dependence would have to be placed on the brakes.

Brake Equipment

Brake equipment generally supplied—that is, brake bands expanding and contracting on a drum on rear wheels—and that on drive shaft—are not entirely adequate on the equipment turned out for freight units, and are less adequate when applied to passenger units, on account of the higher and more sustained speeds.

The adjustments are complicated, and not such that the average driver can make them satisfactorily on the road, and the relining expense is very heavy.

On one route 80 miles low grade, few curves, 40 miles 6 and 7 per cent grades, tortuous alignment, and sharp curves all paved, 10 cars running a total of 470,049 miles, required 81 emergency brake relinings, and 164 foot-brake relinings, or one emergency brake relining for approximately every 5,850 car miles run, and one foot-brake relining for approximately every 2,930 car miles. These were 11-passenger cars, mounted on two-ton chassis, weighing (loaded) 8,200 pounds each.

Ten cars, running a total of 497,215 miles, on a 134-mile route, low grades, paved, one hill 7 per cent, half a mile up and half a mile down, required 43 emergency brake relinings, and 109 foot-brake relinings. These were 18 passenger cars, on two-ton chassis, weight (loaded) 11,350 pounds each; or one emergency brake relining for each 11,550 miles, and one foot-brake relining for each 4,970 miles.

An 18-in. dia. drum, with 3 1/3-in. face, gives a weight of car loaded per sq. in. of brake surface for the 11-passenger of 20 lb., and for the 18-passenger 28 1/4 lb., approximately, whereas the brake lining manufacturers recommend 12 1/2 lb. per sq. in. as about the proper relation.

Wooden wheels in California are not a success, as they dry out quickly and cost a great deal to keep in order. Cast steel wheels with hubs cast in are very expensive to

maintain, and if hub is damaged, cost \$15 to \$17 a piece to fill in and re-face bearing races. Wheels should be cast without hub so that any hub can be fitted to them. A crank-case aluminum wheel of this kind that has now been in use a year or more.

All rear wheels should be fitted with two bearings, especially dual wheels, and should be so designed that the tires will run true, and with air valves accessible. We have had a great deal of trouble with dual wheels and single bearings in the past, but some of the later models provide for two bearings and are showing very good results.

Mr. Howell also criticized the lack of standardization in tire sizes and the sale of tubes which do not approximately fill the casings before inflation. Such tubes, he said, are very easily punctured, while one which fills the shoe before inflation is much less liable to puncture. Efforts to secure such tubes are being made.

Better Bus Bodies Will Increase Sales

"DEVELOPMENTS in Motorbus Body Design" was the title of a paper presented by Hugh G. Bersie, engineer of the Haskelite Mfg. Co. It dealt chiefly with means for making the street car type of bus body lighter, more attractive in appearance, easier to enter and more comfortable for the passengers and driver. Some extracts from this paper follow:

Things that impress the passenger favorably are an attractive general appearance, low steps and floors, wide entrance-doors and aisles, ample head-room and knee-room, comfortable seats, good riding qualities and effective ventilation, lighting and heating.

An excellent arrangement of the Chicago Motor Coach Co. is the use of distinguishing colors for motorbuses serving different sections of the city.

The securing of streamline effects by compound curvatures eliminates the displeasing square-cornered, box-like appearance. The rounding of the front and the molding of the windshield and dash into pleasing curves have been worthwhile efforts.

Decrease in the amount of overhang has resulted from the development of a number of heavy-duty chassis of 190-in. wheelbase or longer. Overhangs that were tolerated a year ago are not considered seriously now.

A low step and a low floor not only affect profits by attracting fares, but also by decreasing the time required for passengers to enter and to leave.

Two well-defined floor constructions seem to exist. When cross-sills about 2½ in. deep are employed, 7/8-in. flooring is laid with the grain running lengthwise of the body. These cross-sills are 18 to 24 in. apart. When the cross-sills are eliminated, 1½ to 1¼-in. flooring is laid directly on the two longitudinal sills or frame channels, but with the grain of the flooring running across the body. These longitudinal sills are about 75 in. apart and, of course, the floor extends nearly 15 in. beyond on each side. This is a rather thick and heavy floor and might be reduced to 5/8 in. by the adoption of structural plywood flooring carried by the longitudinal sills and by cross-sills spaced 5 ft. apart. Tests have shown that, with square panels supported at all edges the Haskelite is approximately 52 per cent stiffer than plain tongue-and-groove lumber of the same thickness.

With the use of supporting stanchions and a 5/8-in. Haskelite roof made in a single piece, the Yellow Coach Mfg. Co. has been able to eliminate all cross bows and

ribs in its Type Z double-deck coach. This increases the head-room 2 to 3 in. From this standpoint alone it is worthwhile, but an added advantage is that it clears up the ceiling, making it more attractive and more easily kept clean and sanitary.

Aisle width varies from 13 to 19 in. and seat width of from 32 to 35 in. The spacing of seats ranges from 28 to 31 in. That spacing provides a distance of between 10 and 11 in. from the front of one seat to the back of the next; and is called "knee-room." Additional space is sometimes gained by the recessing of the seat-backs. This is an excellent plan, and I imagine that all seat manufacturers will soon put out a seat of this kind. At least 1½ in. can be gained by the recessing. A person cannot be expected to patronize a motorbus consistently unless he is seated comfortably.

Heat, Roofs and Insulation

Next in importance to the unavoidable loss of heat through the window glass is the heat waste through the roof. The greatest temperature-difference between the inside and the outside air is at the roof, and hence the heat-flow there is the greatest. This fact calls for a roof that is a good heat-insulator. The heat loss by no means is confined to the roof; a loss through the floor and the sides exists; the latter can be stopped by insulating materials. When metal sides are used, an insulating lining is needed; but this is not required with Plymetl.

Both street-cars and motorbuses have secured good air-circulation with ventilators installed in the arch-type roof. Lately, the tendency has been toward the adoption of small ventilators just above the windows, called louvers. They are much better than no ventilators; but, in my opinion, room for improvement exists. Window sash is showing



R. E. Fielder, chief engineer Fifth Avenue Coach Co., left, and V. E. Keenan, superintendent bus division United Electric Rys. Co.

commendable improvement. In past years windows always rattled or stuck, or did both. Brass or metal sash is a vast improvement over wood.

So far as possible, body parts are to be made easily replaceable. Particularly is this true of windows, panels and the like. Even when the very best materials are used, severe accidents may require their replacement. Side-panels, attached by bolts whose heads are concealed by molding, can be removed easily and replaced with new panels.

R. E. Fielder, chief engineer of the Fifth Avenue Coach Co., presented a paper describing the maintenance system used in connection with the buses operated by this concern in New York.

Success of Commercial Haulers Points Way to Future Truck Development

Experience of operators in maintenance and use of vehicles provides many concrete suggestions for design engineers.

OPERATION of motor trucks and buses no longer need be based on guesses as to efficiency nor on haphazard experimentation as to operating methods, if the data presented at the motor transport session can be taken as typical of haulage practice throughout the country. Organizations transporting materials for many customers already are operating with great effectiveness and methods of maintenance, garaging, delivery, and general transport service have been worked out in the greatest detail. Railcars already are carrying passengers successfully and regularly on 135 short line railroads, while trailers and semi-trailers are facilitating greatly the handling of freight in railway terminals. The use of removable bodies and container cars as well is aiding in the latter task.

Specific means of utilizing the motor truck and railcar as transportation media were given in detail at this session.

J. A. Hoffman and W. F. Banks of the Motor Haulage Co., New York City, gave a comprehensive description of the organization and operating methods used by their company which sells transportation service to various customers. Their paper was supplemented by Evans, assistant chief engineer of the Long Island Railroad, who showed how truck and semi-trailers are being used successfully by this road in bringing freight to central shipping points and in distributing it from such points to way stations.

Mr. Banks said that in buying trucks his company often sacrifices desirable individual characteristics for others which are needed to meet the varied general requirements of their service. Bodies present one of the big problems, he said, from the standpoint of the commercial hauler who has to carry a variety of goods. He stated his belief that side doors are essential in truck bodies, because congested traffic conditions are likely to result in regulations forbidding trucks to back into the sidewalk for unloading.

How to Figure Depreciation

WHEN should a motor truck be retired from service? How should depreciation be figured?

Opinions on these two important truck operation questions varied widely at the Metropolitan Section meeting which was held Thursday evening as a part of the convention program. It was generally conceded before the evening was over that obsolescence occupies a minor role as a factor in motor truck life, and that the time at which a vehicle should be retired hinges upon the following:

1. Whether or not parts can be procured.
2. Breaking down of non-wearing parts, such as frame members, axle housings, etc.

According to Francis W. Davis, who read a paper entitled, "When Does a Truck Become Obsolete?" the ultimate life of a motor truck still is obscure because little progress has been made by manufacturers or users in determining the life of the vehicle as a whole as well

as the life of its parts. Mr. Davis drew attention to the fact that railroads for some time have been guided by knowledge of this kind in giving the life of locomotives and parts thereof.

It is possible to determine the life of a locomotive both in years and mileage. Not until the automotive industry masters this important question will it be possible to draw any definite conclusions as to the useful life of a motor vehicle or to figure accurately its rate of depreciation.

Mr. Davis stressed the need for interchangeability of major units in a vehicle and in this connection said:

"The interchangeability of units such as engine, transmission, axles, etc., will go a long way to facilitate the continued operation of motor trucks which might otherwise go out of service due to the inability to obtain spare parts. Economic laws take their toll among motor truck manufacturers and leave quantities of orphan trucks, and oftentimes manufacturers carry on a series of changes which greatly complicate service problems. It might be inferred that the manufacturers could speed up the retirement of old trucks by discontinuing to supply spare parts. The standardizing of mountings together with accessories and control location is the answer to the orphan truck and lack of spare parts situation."

Railcar Development Assured

IT is my belief that, as the development of motor cars proceeds, practically all branch lines and short lines will in time become motorized, and that even a considerable mileage of local trunk-line steam-train service will be replaced with motor cars. Schedules may be arranged so as not to conflict with through-train service and, at the most important terminals, a plan might be worked out by which local motor-cars could be run into the business sections of cities over street-railway tracks."

This was the cheering message brought to railcar engineers by James W. Cain, manager of purchases, American Short Line Railroad Association. In his paper on "Motor Railcars," Mr. Cain pointed out that although a great sum of money has been expended in experimental work, part of it has been misdirected, and that the actual investment in serviceable railcars today probably does not exceed \$2,500,000.

Trailers Reduce Time Loss

WHEN should trailers be used? H. W. Howard, transport engineer, General Motors Truck Co., answered this question broadly by saying that "The question as to what is the most economical and practical equipment depends entirely on the conditions surrounding each haulage problem." He amplified his general conclusion, however, with a detailed outline of the specific conditions under which trailers of various types can be used effectively. Semi-trailers, removable bodies and other modern haulage helps also were discussed by Mr. Howard. He said in part:

Electrical Manufacturers and Service Men Adjust Differences

Closed session at Automotive Equipment Manufacturers' meeting results in general agreement regarding sales policies.

Progress in standardization work is continued.

By C. P. Shattuck

WHEN the four-day summer meeting of the Automotive Electric Association came to an end at White Sulphur Springs with a final meeting of the board of governors, much had been accomplished. Of particular interest to all groups, the manufacturer, engineer and authorized service station, was the report of the standards committee on classification of the standard lighting generators, starting motor and recommended practice in wiring. While certain phases of these reports were discussed the changes made were slight. The committee was complimented for its efficiency, the reports being the occasion of considerable favorable comment. The Standards Report will be printed in booklet form for the general information of engineers and executives in the industry.

As a result of the efforts of the Automotive Electric Association to bring about proper illumination by headlights there was a discussion in which the bulb manufacturers participated. The latter pointed out that the design voltage of 6.35 had been raised in some instances to 6.5, also that longer and more satisfactory life could be expected of bulbs.

Variables in Production of Lamps

The lamp representatives also held that there were many variables in production and all those participating in the discussion expressed themselves as confident that there would be less reason for criticism in the near future. The A. E. A. members are seeking proper illumination which includes the factor of state regulation, and as a result of the exchange of ideas it was decided that the standards committee of the association meet with a similar body of the lamp makers.

Inasmuch as the board of governors of the Automotive Electric Association, representing the central service and authorized service stations, were present as guests, there was a service flavor at various sessions. One evening session was set aside for an open discussion of the subject for members and guests, and the discussion on specialized electric service was to be initiated by the board of governors of the service organization.

This service meeting did not develop as planned, for it is alleged that certain members of the board requested a strictly closed meeting with the manufacturers. This was granted. According to reports specialized service was discussed only in the abstract, but it is said that from this meeting resulted a better understanding between the service association and the manufacturers.

Two service papers were presented by guests, one by Sidney J. Stern, Automotive Merchandising, whose subject, "A Suggestion to Strengthen the One Weak Link in

the Chain of Automotive Electrical Service," pointed out the lack of authorized service in the smaller places. The second paper was presented by C. P. Shattuck, service editor, Chilton Co., who analyzed service in the field and made suggestions for improving it and making it more profitable for the service station.

The A. E. A. submitted a plan which is believed will simplify the method of contact between the manufacturers and their representatives and the service men, as well as effect economy of time. It is proposed to so schedule the week at the Chicago show that contact will be made without loss of time. It is also proposed the manufacturer or his representative present 10 minute service talks at an open meeting of the service association.

B. L. Shinn, special representative, vigilance committee, Associated Advertising Clubs of the World, presented a very constructive paper on advertising.

A resolution of condolence was adopted on the death of John W. Tracy, and copies sent to Mrs. Tracy and the North East Electric Co.

Among the new members elected to the Automotive Electric Association were lamp makers who were designated by the representatives, the interests being the General Electric Co., National Lamp Works, Edison Lamp Works and the Westinghouse Lamp Co.

The meetings were presided over by A. D. T. Libby, president, and were well attended by both class A and B members. There will be an executive session of the executive committee at Cleveland on Nov. 12. The attendance at the summer meeting was excellent. There were the usual golf, tennis, etc., with prizes for the winners.

A careful study by the Automotive Electric Association of representative applications of electrical apparatus to automobile starting and lighting has resulted in a classification of this apparatus covering the whole range of ordinary requirements. The following classification applies directly to 6-volt systems, and where other voltages are used equivalent performances are to be shown.

Generators

Generators for automotive work are divided into five classes. The ratings are based on a test in which the machines are operated at their maximum load until the rate of temperature rise has fallen to 2 deg. per half hour, after which the performance is to be in accordance with the figures given below. Where regulation is by means of a third brush alone, the following classification is recommended (with equivalent performances where regulation is by other means).

No. 1 generator—At a speed not exceeding 1050 r.p.m. to give not less than 7 amps. at 8 volts.

At a speed not exceeding 1600 r.p.m. to give not less than 10 amps. at 8.5 volts with a rise in temperature not exceeding 100 deg. C.

At a speed not exceeding 2200 r.p.m. it will permit the current to be maintained at not over 9 amps.

No. 2 generator—At a speed not exceeding 1050 r.p.m. to give not less than 8 amps. at 8 volts.

At a speed not exceeding 1600 r.p.m. to give not less than 12 amps. at 8.5 volts with a rise in temperature not exceeding 90 deg. C. when measured not over 1/16 in. away from the commutator.

At a speed exceeding 2200 r.p.m. it will permit the current to be maintained at not over 11 amps.

No. 3 generator—At a speed not exceeding 1950 r.p.m. to give not less than 10 amps. at 8 volts.

At a speed exceeding 1600 r.p.m. to give not less than

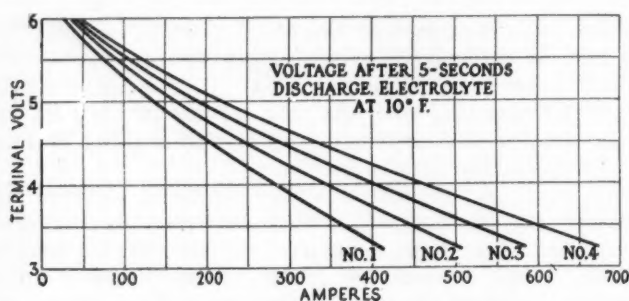


Fig. 1—Standard battery terminal voltages for different current draws

15 amps. at 8.5 volts with a rise in temperature not exceeding 90 deg. C., when measured with a thermometer not over 1/16 in. away from the commutator.

At a speed not exceeding 2200 r.p.m. it will permit the current to be maintained at not over 13 amps.

No. 4 generator—At a speed not exceeding 700 r.p.m. to give not less than 7 amps. at 8 volts.

At a speed not exceeding 1050 r.p.m. to give not less than 10 amps. at 8.5 volts with a rise in temperature not exceeding 90 deg. C. when measured with a thermometer not over 1/16 in. from the commutator.

At a speed not exceeding 1400 r.p.m. it will permit the current to be maintained at a value of not over 9 amps.

No. 5 generator—At a speed not exceeding 700 r.p.m. to give not less than 10 amps. at 8 volts.

At a speed not exceeding 1500 r.p.m. to give not less than 15 amps. at 8.5 volts with a rise in temperature not exceeding 80 deg. C. when measured 1/16 in. from the commutator.

At a speed not exceeding 1400 r.p.m. it will permit the current to be maintained at a value of not over 13 amps.

All temperature measurements are to be made with a thermometer not over 1/16 in. from the commutator. Generator tests to be made with commutator cover in place and the thermometer inserted through a hole in the commutator band. The generator to be mounted in the test stand in a manner similar to that in which it will be mounted on the car. This specification does not contemplate the use of external blowers or fans in making temperature tests.

The foregoing specifications give three points on the speed-current curve of the generator. These points are sufficient to practically determine the output of the generator at its important speeds. The speed at which the generator produces 6½ volts, commonly called the cut-in speed, is not given, since the 7 and 8 amp. speed is of more importance and at the same time practically determines the cut-in point. The miles per hour car speed may

be obtained from the generator r.p.m. by the use of the following formula:

$$M = \frac{N \times D}{336 \times r \times R}$$

Where M = m.p.h.; N, generator speed; D, tire diameter in inches; R, rear axle ratio; r, ratio of generator to engine speed.

No. 1 generator is intended to be driven at approximately 1½ times engine speed where the rear axle ratio and the wheel diameter are such as to give about 75 r.p.m. per mile per hour car speed. Dividing 1050 r.p.m. by 75 gives 14 m.p.h. for a generator output of 7 amps.

No. 2 generator gives a somewhat higher output when used with a 1½ ratio.

No. 3 generator has a larger output for use on larger cars and is preferably driven at greater than crankshaft speed.

No. 4 machine is intended for cars in which the generator is driven at engine speed or less, for example, when the generator rotates at 50 r.p.m. per mile per hour, the output will be 7 amps. at 14 m.p.h.

No. 5 generator is the same as No. 4, with the exception that the output is considerably increased. The machine is intended for engine speed drive, but is in little demand as a third brush generator on account of the numerous uses of voltage regulator equipment.

Note—The performances specified in the above classification are for generators when hot or at such temperatures as they will attain on the road.

Choosing the Proper Generator

The method of choosing one of the classified generators for a particular car is largely a matter of service and experience. A car using the resistance method of dimming the headlights would require a larger generator and battery than a car equipped with separate bulbs or sidelights for parking. Headlights when dimmed through a resistance use only slightly less current than when turned on bright. Sidelights of low candlepower, separate lamps in the headlights, or double filament lamps give much better economy during night parking than resistance dimmed headlights, and are to be preferred.

A high grade car often uses a larger generator, chiefly

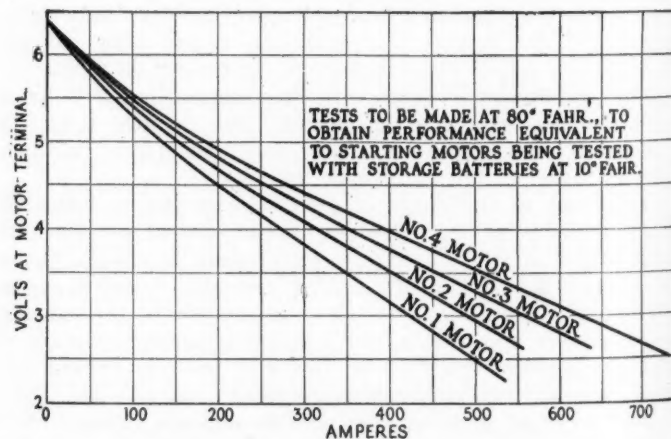


Fig. 2—Chart for use in starter tests

to insure an adequate source of current supply, although the demand for electrical energy may not be greater than with a less expensive car.

If the generator fitted to a car is of inadequate capacity it will not deliver sufficient current to keep the battery charged. Experience has shown that slightly overcharging a battery does very little harm compared to under-

charging, and it is evident, therefore, that much better service is obtained with a liberal sized generator.

Standardized Storage Batteries

Practically all battery requirements for passenger cars in the 6-volt class can be met with four sizes of battery known as Nos. 1, 2, 3, and 4, whose characteristic curves are shown in Fig. 1. These batteries, which have been adopted as standard, have a rating of 80, 100, 120, 150 amp. hrs. at the 5 amp. rate.

Standardized Starting Motors

Battery size affects starting motor performance, and in practice it ordinarily varies with the motor. Motors have

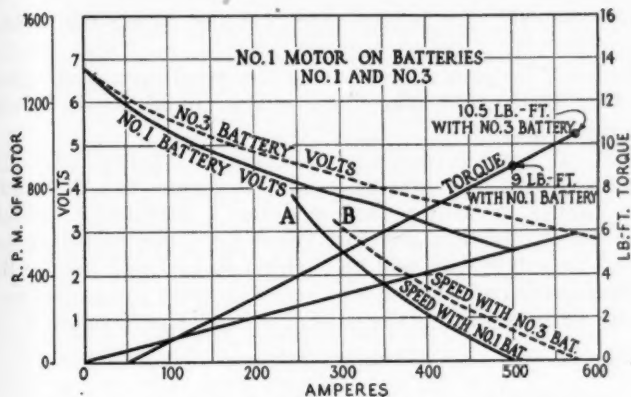


Fig. 3—Characteristic curves of starter motor

been classified according to performance, and four sizes have been approved, known as Nos. 1, 2, 3 and 4.

Fig. 2 shows four standard curves adopted to represent the voltage at the terminals of motors Nos. 1, 2, 3 and 4, when used with Nos. 1, 2, 3 and 4 batteries respectively, at a temperature of 10 deg., which temperature is chosen for the tests because battery capacity and motor torque both decrease at low temperatures. When the respective motors are tested at the usual room temperature of 80 deg. with the voltages given in Fig. 2 the resulting performance will approximate that of the combination of battery and motor at 10 deg. which eliminates the difficulties associated with tests at 10 deg. F.

In determining the standard motor voltage curves, a line drop of 0.12 volt per 100 amps, is assumed, which corresponds to good practice, and the resistance of the motor windings at 10 deg. is assumed, and a suitable allowance made for the difference in armature resistance loss.

The following ratings for 6-volt motors are based on gear reduction of approximately 10:1 between the cranking pinion and the flywheel. If the gear reduction is substantially different, a proper allowance should be made.

Choosing Proper Starting Motors

No. 1 motor with No. 1 battery, locked torque 9 lb.-ft., 0.43 hp. at 400 r.p.m.

No. 2 motor with No. 2 battery, locked torque, 12.5 lb.-ft., 0.60 hp. at 400 r.p.m.

No. 3 motor with No. 3 battery, locked torque, 17 lb.-ft., 0.83 hp. at 400 r.p.m.

No. 4 motor with No. 4 battery, locked torque, 24 lb.-ft., 1.00 hp. at 400 r.p.m.

It is not essential to use a No. 1 battery with a No. 1 motor, but the use of a smaller than No. 1 battery should not be considered. The use of a No. 2 or larger battery with a No. 1 motor improves the performance of the starting motor, as is shown in Fig. 3, where the solid line represents the motor on a No. 1 battery and the dotted line on a No. 3 battery. At 6 lb.-ft. torque the speed is increased from 359 r.p.m. to 460 r.p.m. by using the larger battery. The maximum torque that can be obtained with this motor is 9 lb.-ft. with the No. 1 battery and 10.5 lb.-ft. with the No. 3.

A considerable improvement in cranking is obtained by the use of a larger battery, which, besides having a beneficial effect on the generator performance, results in increased battery life. Although the S. A. E. has published a recommended practice for a battery—ground connection, it is not generally followed, and in some cases inferior connections are used. This is frequently the cause of cranking failures, and the voltage drop at the connection results in generator trouble.

Starter Performance vs. Battery Size

As an illustration of the effect on motor performance, consider a No. 1 motor with a No. 1 battery. The cranking speed is 400 r.p.m. at 5.6 lb.-ft. torque, but with an additional one-half volt drop at the ground connection the speed is brought down below 300 r.p.m. The locked torque on this motor and battery combination decreases from 9 lb.-ft. to 8 lb.-ft.

Fig. 4 illustrates the effect of voltage drop at the ground connection upon the generator output. The increased outputs may result in the destruction of the generator. In addition the high voltage causes extra wear on the ignition contacts, and may also result in burning out the lamps. In general, a battery that has sufficient cranking ability will have more than enough capacity for other requirements. No detrimental effects arise from the use of a large battery, and besides the increase in starting

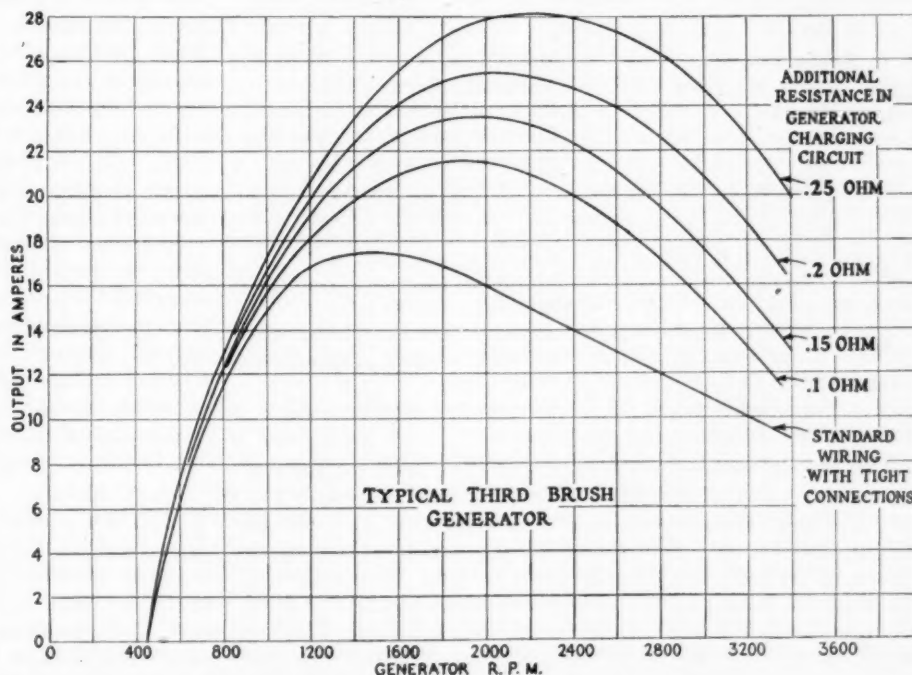


Fig. 4—Curves showing effect of high resistance connections in main circuit of third brush generator on generator output at different speeds

performance there are several other advantages. A larger battery when fully charged will have more reserve energy for taking care of lamp load when cars are parked at night for long periods. On long drives, the larger battery holds the charging voltage at a lower rate, and tends to prevent high outputs from the generator.

The proper size of starting motor for any engine can best be determined by testing a number of engines at low temperatures. Data obtained from tests on a single engine are not reliable, as engines of the same make and model vary considerably in their cranking torque characteristics. No fixed relation between engine displacement and cranking torque can be set; other factors besides the displacement affect the break-away and cranking torque to a large extent, including the number of crankshaft bearings, the kind of oil, the material of the bearing caps, the precision of manufacture and whether poppet or sleeve valves are used.

The Association also adopted a Recommended Practice, relating to installation and wiring. It is recommended that when selecting the electrical equipment, consisting of starting motor, generator, ignition unit, battery, wiring, switches, sockets and lamps, it should be seen that this conforms to S. A. E. dimensional standards and A. E. A. performance standards. Such sizes of the above units should be chosen as will provide a suitable margin of safety, or over-capacity, rather than such as will barely

do average work under ordinary normal conditions.

The Recommended Practice goes into considerable detail in connection with each item, generally referring to the S. A. E. standards or recommended practices pertaining to the item and giving additional information of a nature generally known to those familiar with electrical equipment, but unfortunately not always applied.

Manufacturers often fail to get full value from their advertising because they have a tendency to do and say the same thing as their competitors and because they make meaningless general statements about their products instead of specific statements which tend to individualize. This was the gist of a talk made by B. L. Shinn, special representative, National Vigilance Committee Associated Advertising Clubs of the World. Advertising may be very harmful, Mr. Shinn said, without being untruthful or unlawful. Every battery cannot be "the world's greatest," he pointed out to the electrical men, and claims of this kind often take away public confidence in advertising of all kinds.

"Make your copy clear as regards guarantees," Mr. Shinn urged, "by stating every condition and don't run the chance of losing your customer's confidence. While you are doing this and fortifying your own standing before the public, you will be curbing to no small degree the unscrupulous advertiser who seeks to use a guarantee as a mean of stimulating the sale of an inferior product."

Air Mail Is of Service to the Automotive Industry

DOES the automotive industry use the Air Mail to its best advantage? The list of 250 organizers and early supporters of the Air Mail Extension Committee includes the names of many firms prominent in the automotive field, and the benefits derived by manufacturers from the Air Mail bid fair to increase materially as the advantages and operations of the new service become more fully understood.

Many manufacturers are using the Air Mail in improving contact with distributors and dealers, speeding letters and orders, and meeting rush emergencies. Prominent companies which are members of the Extension Committee include:

A. C. Spark Plug Co.	Moto-Meter Co.
Amer. Bosch Magneto Co.	Nordyke, Marmon Co.
Briggs Mfg. Co.	Packard Motor Car Co.
Brown-Sharpe Mfg. Co.	Pierce-Arrow Motor Car Co.
Cadillac Motor Car Co.	Pioneer Instrument Co.
Charles B. Bohn Foundry Co.	Rickenbacker Motor Co.
Detroit Motorbus Co.	Sinclair Consolidated Oil Co.
Detroit Steel Products Co.	Soc. of Automotive Engineers.
Fairbanks-Morse & Co.	Sperry Gyroscope Co.
Fisher Body Co.	Splittorf Electrical Co.
Ford Motor Co.	Standard Oil Co.
Goodyear Tire & Rubber Co.	Standard Oil Co. (Ind.)
Hudson Motor Car Co.	Stewart-Warner Speedometer Co.
Jordan Motor Car Co.	Yale & Towne Mfg. Co.
Mosler Mtl. Products Co.	
Morse Chain Works.	

The wholly successful operation of the trans-continental Air Mail service on the thirty-two hour schedule has proved its entire practicability and reliability to such an extent that the Air Mail Extension Committee, with main offices in New York City, has been formed quite recently. Its object is to emphasize the inauguration of the Air Mail as a public utility and necessity, to extend the Air Mail to cities outside of the present route, and to point out the advantages that will accrue to business through the use of the Air Mail. A million seals to be attached to Air Mail correspondence are now available. Any number can be

supplied to members of the committee at a nominal cost.

Any mailable matter will be carried by airplane, providing it bears sufficient postage and providing also that the individual packages conform to the dimensions prescribed by the parcel post regulations. The dimensions must not exceed 84 in. in length and girth, and must not exceed 50 lb. in weight.

The present Air Mail lines extend from New York to San Francisco. The Eastbound trip is accomplished in 31 hr. 35 min., the Westbound in 34 hr. 45 min. The route is divided into three zones for the regulation of charges. One zone is a division from New York to Chicago, another from Chicago to Cheyenne (night flying), and the third from Cheyenne to San Francisco. The postage is 8 cents an ounce for each zone or part of zone in which mail is carried by airplane, therefore all mail must be fully prepaid, 8 cents for the first zone, 16 cents for the second zone, and 24 cents for the last zone. Special air mail boxes painted distinctively in red, white and blue have been installed in 18 leading cities throughout the country.

A special delivery stamp in addition to the air postage may be used to insure prompt delivery. Mail will be accepted for registration on the prepayment of a registration fee ranging from 10 to 20 cents in addition to the regular postage. It is important that where ordinary postage stamps are used for mail to be carried by air the envelope should be indorsed "Via Air Mail," the words being placed immediately above the address on the right hand side.

UNDER a new regulation issued by the Federal Minister of Finance a tax of five gold marks per day must be paid on automobiles brought into Germany for short periods. The tax for motorcycles is much less, only five gold marks per month. This ratio of 30 to 1 can hardly have been established on the basis of the relative damage to roads by the two classes of vehicles; probably the basis worked on was the assumed relative ability to pay, of motorists and motorcyclists.

Just Among Ourselves

Slogans—Are They Bunk or Business Builders?

DESPITE the fact that Presidents have been elected and kingdoms destroyed through a judicious use of slogans and catch-phrases, a large proportion of these smooth word combinations have failed to influence thinking people to any great extent because they just don't mean anything. Every once in a while somebody thinks of a phrase which trips lightly off the tongue and at the same time has its basis in sound logic. The automobile field has had more than its share of slogans and its percentage of effective ones has been about the same as that of other industries. Several have stood the test of time, because they did mean something. Every automobile manufacturer for example knows that the best advertisement he can have is the satisfaction of present owners and many have sold additional cars on that basis, but it would be hard to tell that particular story any more briefly than in the words, "Ask the man who owns one." Others of equal merit have endured in the automotive field. The Raybestos Company recently devised a phrase by which the whole industry may profit. It runs "Forget the business outlook—be on the outlook for business." The power of the slogan as a sales stimulant never can be discounted, but the permanent effectiveness of a particular slogan depends not only on its phonetic, but also on its logical qualities.

Cleanliness, Chinese Insist, Is Next to Godliness

DRIVERS of the "Pedicab," the Chinese taxi, must not eat garlic under pain of a \$100 fine, the Department of Com-

merce has just been informed.

The "Pedicab" is a form of bicycle rickshaw propelled as a push bicycle, the driver sitting in front and working the pedals, while the passenger sits in a "most comfortable carriage behind."

In addition to their abstinence from garlic, the drivers of the "Pedaicabs," which are fast shunting the time-honored rickshaws into oblivion, must wear uniforms, and bathe regularly.

Closed Car Output Continues to Increase

THE continued popularity of the closed car is emphasized by the fact that General Motors figures show the proportion of closed car production every month this year to have been greater than during the same period in 1923. Velie has announced that its entire production has consisted of closed jobs for the last four months. Every year the percentage of total production comprised of closed cars has crept up a little higher and the indications are that the advance will be continued in 1924. The closed car percentage for the industry as a whole seems certain to reach or surpass 40 per cent this year.

Profits for Everyone Goal of 1925 Merchandising

BUSINESS is picking up. Everybody is beginning to feel better. But right away murmurings have to begin about overloading dealers again. Not everybody will agree about what constitutes overloading, but some dealers claim already to have received instructions from manufacturers, issued in no uncertain terms, which ask them to

take more cars in the next few months than the retailers think they can reasonably expect to sell. It is hardly possible, however, that there could be any general repetition of the mistakes made last winter. The troubles generated by overloading are so recent that their causes could not be forgotten at this early date. "Profits for everybody in the business—not volume" certainly will be the 1925 slogan.

Making a Sales Agent of Santa Claus

SANTA Claus' automotive department is getting ready for some warm work when the cold weather sets in. Automotive equipment men in particular seem to have made up their minds to cash in on the Christmas spirit this year more than ever before. Practically all of the companies replying to a recent questionnaire sent out by the Automotive Equipment Association replied "Yes" to the question, "Are you planning to use special Christmas boxes and wrappers this year?" A large percentage of them are preparing other Christmas sales helps for their dealers, and the campaign is being backed up by trade paper and consumer advertising in most cases. These business seekers certainly are on the right track. It's easier to get money from people just before Christmas than at any other time of the year. Stingy men take the opportunity to make themselves feel generous by giving to their wives as presents things that should have been bought as necessities months before, while free-spenders open their purse strings wide and buy more than they can afford but less than they want. Every automotive manufacturer should get his share.

N. G. S.

Ingenious Device Used to Determine Unburned Fuel in Exhaust Gases

Exhaust gas mixed with air can be ignited by electrically heated platinum wire. Explosion increases temperature of wire, adds resistance. Wheatstone bridge measures latter.

THE use of an instrument manufactured by the Siemens & Halske Electrical Works for the determination of the percentage of unconsumed fuel gases in flue gases, in an investigation of internal combustion engine exhaust gases is discussed in *Der Motorwagen* by M. Moeller and M. U. Büchting.

This instrument is based on the principle that any fuel gases contained in exhaust gases, if mixed with a suitable proportion of oxygen or air, can be ignited and burned if led past a moderately heated wire of a metal having catalytic properties, such as platinum. With wires of the base metals, such as iron, it would be necessary to heat to redness in order to induce combustion, but with platinum it is only necessary to heat the wire to 750-800 deg. F., which is materially below red heat.

Combustion of the fuel gases admixed with the exhaust gases causes a rise in temperature of the platinum wire,

in temperature of the wire on combustion of CO does not differ materially from that on combustion of H_2 . It is therefore practicable to calibrate the instruments in percentages of $CO + H_2$ without risking serious errors.

The small proportions of heavy hydrocarbons usually contained in the exhaust gases result in a temperature rise of the wire which is proportional to their heats of combustion, and they are therefore included in the indications. But as compared with the CO and H_2 these vapors, as a rule, are of no consequence.

Instruments Consists of Two Parts

The instrument consists of two parts, the transmitter with the measuring chamber (Fig. 2) and the indicating instrument serving as receiver (Fig. 3). The former comprises a box-like housing; the small measuring chamber contained therein is a flat block of metal with two short, large bore holes in which the two wires A and B are located. Through the bore hole containing wire A the exhaust gases are drawn, while the hole containing wire B is filled with air. Outside the measuring chamber are located the two standard resistances C and D, which are not sensitive to temperature changes. On the left side of the transmitter near the bottom is the air nozzle, which is protected against incrustation by a little cotton waste. The gas connections are at the bottom, the electrical connections for the receiver on top at the left, for the source of current on top at the right. A small storage battery will serve as the source of current and an ordinary water jet (injector type) pump as the suction device.

The indicating instrument is a movable coil galvanometer inclosed in a water-tight housing, which is conspicuously mounted on the testing stand and is calibrated in 0-8 per cent of $CO + H_2$.

Fig. 4 shows diagrammatically how the instrument is mounted on a test bench. Exhaust gas is collected at the end of the exhaust pipe and carried to the instrument

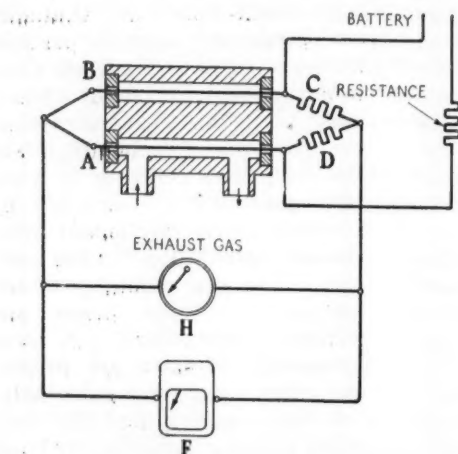


Fig. 1—Diagram of electric circuits of Siemens & Halske $CO + H_2$ indicator

and if the fuel content is large enough this may be sufficient to cause the previously dark wire to glow slightly. An increase in the temperature of the wire is accompanied by an increase in resistance, which can be measured by means of a Wheatstone bridge.

The arrangement is shown diagrammatically in Fig. 1, where A represents the wire catalyst; B, the standard wire in air, which serves to take account of changes in atmospheric temperature; C and D, standard resistance; H, an indicating instrument and F a registering apparatus.

Owing to the fact that the exhaust gases as a rule do not contain sufficient oxygen to assure complete combustion, that is, one half of the volume of the CO and H_2 it is necessary to provide a nozzle in the exhaust gas line before it enters the apparatus, through which 30 per cent. of air can be added. As the heat of combustion of CO and H_2 is nearly equal (on a volumetric basis), the rise

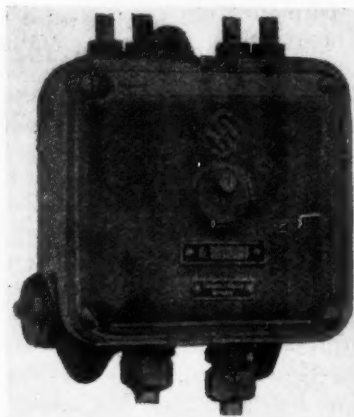


Fig. 2—Transmitter



Fig. 3—Receiver

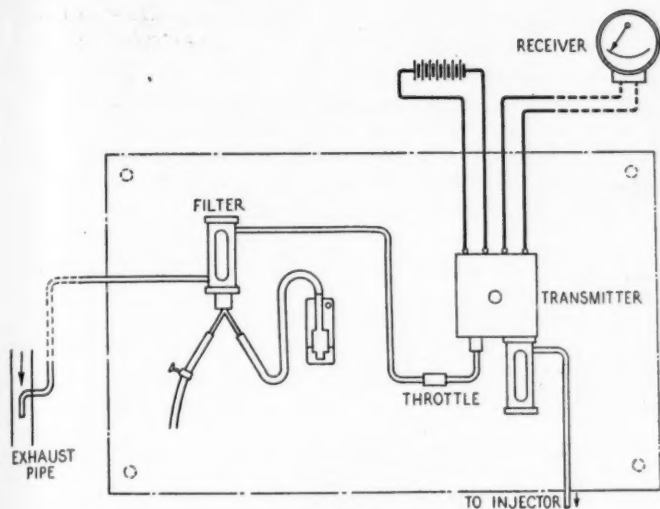


Fig. 4—Installation diagram

through a $\frac{1}{2}$ in. gas pipe and a copper tube. The filter was filled to one-third its height from the bottom with calcium chloride as a drying agent, and the rest of the distance with glass wool and cotton waste. Below the filter there is a small bottle which serves to even out pressure variations in the exhaust pipe. In the line between the filter and the CO transmitter there is a throttling section, in the form of a short length of brass tubing of fine bore. This serves to introduce a certain resistance to the inflow, bearing a certain relation to the nozzle in the transmitter, through which 30 per cent of air is at all times drawn in. On the right side of the transmitter near the bottom there is a pressure gage filled with glycerine, which gives an indication of the rate of flow of the exhaust gases into the instrument. From the pressure gage the line leads to the injector pump.

Tests and the Results

In the article in *Der Motorwagen* from which the above is taken there are described extensive tests made with the apparatus described. The device is said to have operated perfectly throughout the tests and the following summary of the results of the tests is given:

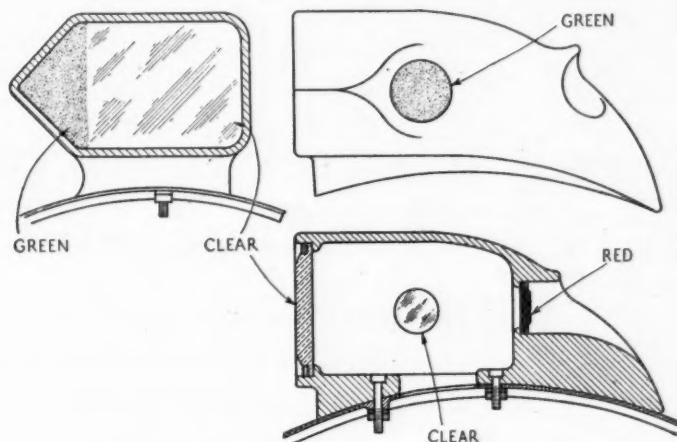
The content of unconsumed fuel gases in exhaust gases depends upon—

1. The load on the engine; the percentage of unburned fuel decreasing with increase in load.
2. The compression; the fuel gas content increasing with the compression.
3. The adjustment of the carbureter; when adjusted for a lean mixture the percentage of unburned gases is smaller.
4. The timing of the ignition; when the spark is retarded there are more unburned gases in the exhaust than when it is advanced.
5. The lubrication of the engine; if oil is supplied in excess the proportion of the unburned gases in the exhaust is greater.

It is believed that the new indicator will prove useful in routine tests of stock engines in the test room as well as in making carbureter adjustments and fuel tests.

New Lamp for City Driving

A DRIVING light for automobiles which embodies some novel features has been developed by Raymond H. Baur of Washington, D. C. It consists of an aluminum casting which will probably be made in the form of a die-casting, which is mounted on the crest of the front fender. A standard lamp socket can be used



New fender-mounted lamp for city-driving and parking

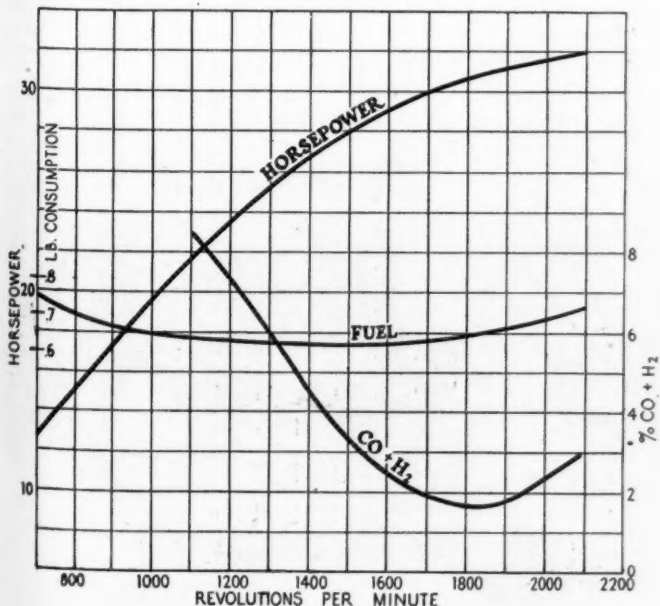


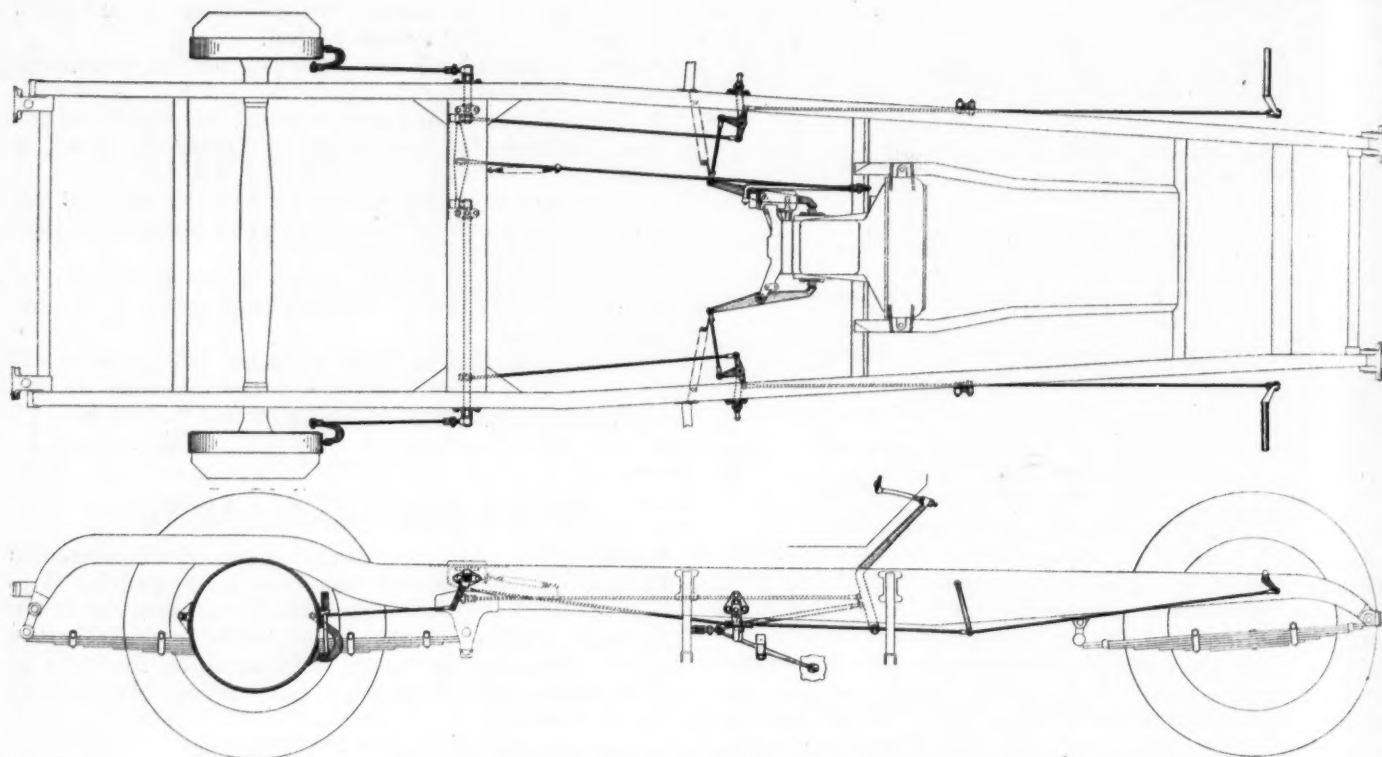
Fig. 5—Curves of horsepower, fuel consumption and CO + H₂

and fastened by screws to the fender, an opening being left for the socket in the bottom of the lamp.

The front glasses of these lamps are of peculiar shape. They comprise a main rectangular section of mat white color, and adjacent thereto a triangular section in green. The lamps are so fitted to the fenders that the green section is toward the outside on both sides of the car, so that even if one of the lamps should go out an oncoming driver would know what side of the car was lighted. Each lamp has a jewel-like green lens on the outer side, which gives a warning to drivers approaching at right angles, and a similar clear lens on the inner side, which ordinarily is cut off from the inside of the lamp by a shutter. If it is desired to do some work on the engine or other part under the bonnet, the shutter can be turned by means of a lever outside the lamp, to cause the lamp to throw a beam of light into the engine space.

In the rear of the lamp there is a ruby red round lens, and these lamps therefore serve as reserve tail lamps. At the same time these rear ruby lenses give visual indication to the driver that the lamps are lit.

It is claimed that these lamps give sufficient light to drive by in the city and at the same time serve as efficient parking lights.



Brake linkage for four-wheel brake installation on Big Six and Special Six

New Features Involved in Studebaker Brake Linkage and Transmission

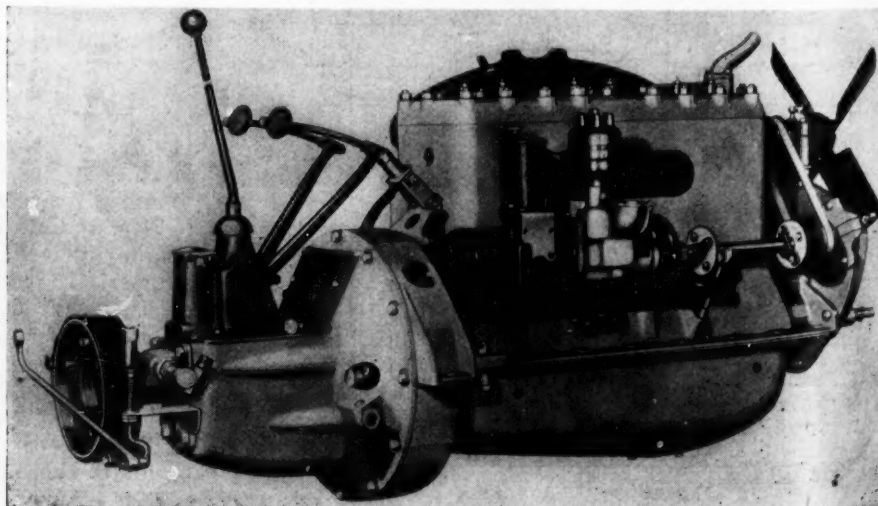
Details of the four-wheel brake system which operates through a servo mechanism, and which is optional on all models. Transmission on the Standard Six is very similar to that on the other models.

SEVERAL additional illustrations of the new Studebaker models described in last week's issue of *AUTOMOTIVE INDUSTRIES* are shown herewith, including a layout of the braking mechanism for four-wheel brake equipment.

The front wheel brakes are supported by brackets forged integral with the steering knuckles. These brackets have diametrically opposite arms which make an angle of about 60 deg. with the vertical, the outer end of the forward arm being above the horizontal. The brake cover plate bolts to this bracket.

There are two cast aluminum shoes to which the brake lining is riveted. These shoes act internally on the brake drums which are riveted to flanges on the wheel hubs. Both shoes are pivoted on studs supported by the outer end of the forward arm on the supporting bracket. In the other end of the shoes are set steel blocks against which the expander cam acts. This cam is located on the outer end of a short shaft supported by the rear arm of the supporting

bracket. On its inner end, it has a crank arm which connects to a link through a ball joint. This link extends upward and forward at an angle of about 45 deg., and at its upper end it connects through a second ball joint to a crank arm on the outer end of the brake operating shaft.



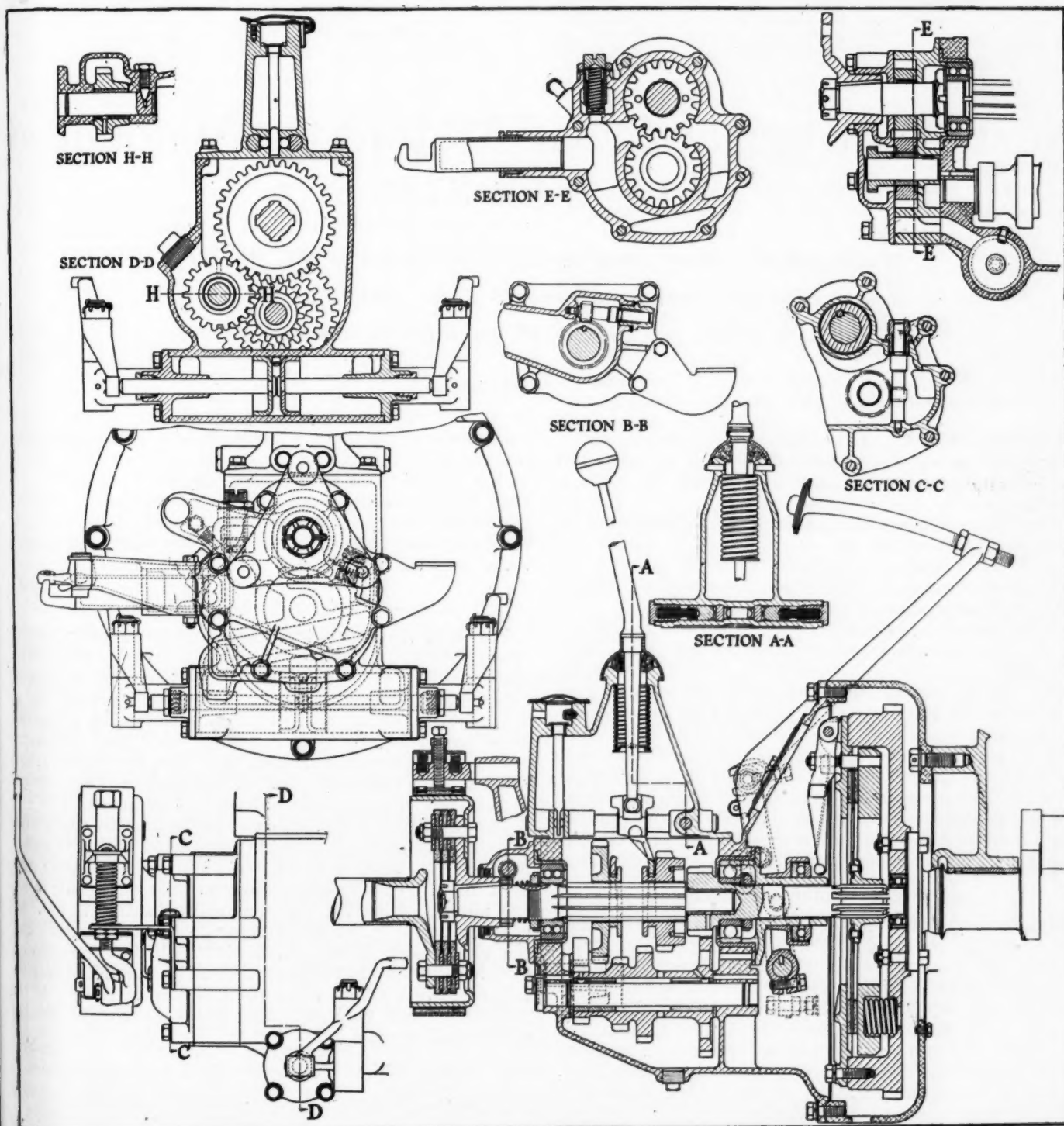
Standard Six powerplant

The center of this latter ball joint lies approximately in the prolonged axis of the steering knuckle. In the front wheel brake axles, the steering gear arm is a taper fit in the brake supporting bracket and is locked in place with a castellated nut. The steering knuckle arm is forged integral with the lower end of the brake supporting bracket. The pin carrying the ball to which the tie rod connects is a taper fit in the knuckle arm and is secured by a castellated nut.

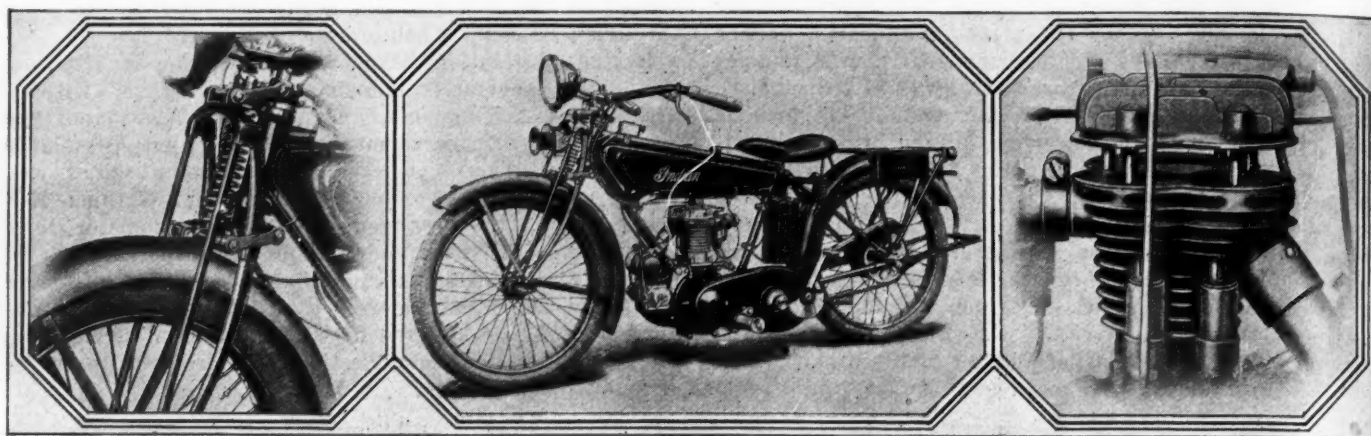
The transmission on the Standard Six, of which some illustrations are shown herewith, is very similar to that on the Big Six and Special Six, which was illustrated and described in detail last week. One difference is in the arrangement of the operating plunger of the brake, which moves longitudinally on the larger models, but trans-

versely on the Standard Six, being connected to the pedal through a link and a bell crank.

In the illustration below are shown one longitudinal section of the clutch, transmission and brake (without brake servo mechanism), and one rear elevation of the transmission with servo mechanism. Section A-A shows part of the gear shift lever and its mounting, as well as the shifter bars and locking dogs; Sections B-B and C-C show the arrangement of the speedometer drive on transmissions with and without servo mechanism, respectively; in the upper right hand and lower left hand corner are shown two views of the oil pump or servo mechanism for the brakes, the first a longitudinal section and the last an outside view; Section E-E also is through the oil pump, transversely.



Detail and assembly views of Studebaker Standard Six transmission



Showing the front spring suspension, left; the new machine which is the first single cylinder model produced in ten years, center, and detachable cylinder head, Ricardo type

New, Light-weight Indian Motorcycle Announced to Sell for \$185

Single cylinder, three speed model to be known as the "Prince" weighs only 235 pounds and is said to be capable of 50 m.p.h. 90 to 100 miles per gallon of gasoline is claimed for it.

By L. S. Gillette

ANNOUNCEMENT of the 1925 series of Indian motorcycles marks the introduction of an entirely new lightweight model known as the "Prince." Its price is \$185.

The "Prince" is a single cylinder, three-speed touring machine, weighing 235 lb. It is said to be capable of over 50 m.p.h. and to average between 90 to 100 miles per gallon of gasoline. Ten years have elapsed since a single cylinder motorcycle was produced.

A number of important mechanical improvements and refinements have been incorporated in the "Big Chief" and "Scout" models, which are to be carried on through 1925. On the former model the most noticeable change is the adoption of Goodyear 26 in. by 3.8 in. balloon tires as standard equipment. A new adjustable front fork with longer rocker leverage, enables the spring power to be set to suit the weight of the driver. The clutch plate area has been increased 35 per cent, making for longer life and giving smoother action. Other improvements include more efficient brakes, easier operated kick starter, a simplified oil pump and individually balanced motor.

Power of Motor Increased

Besides incorporating most of the mechanical changes announced on the "Big Chief," the power of the motor on the new "Scout" model has been improved 20 per cent without increasing the piston displacement. This has been accomplished by the redesigned cylinder heads which are now of the Ricardo type and detachable, it being possible by this design to remove carbon in about 30 min. without disturbing any parts or connections. Larger exhaust and inlet valves with wider cams provide better passageway for the gases.

* Following typical Indian practice, the new "Prince" model carries side by side valve motor, having a bore

and stroke of $2\frac{3}{4}$ in. x $3\frac{37}{64}$ in., giving a piston displacement of 21.25 cu. in. A detachable cylinder head of the Ricardo type is used, gas tightness between head and cylinder being assured by a copper asbestos gasket of automobile type. Many of the important parts, such as pistons, valves, piston pin, are of the same type as are those used on the "Scout."

Sliding Type Transmission

Power is transmitted to the three-speed progressive sliding type transmission through a single dry disk plate clutch which is controlled by a lever on the left-hand side of the handlebars. Drive to the rear wheels is by a $\frac{5}{8}$ -in. x $\frac{1}{4}$ -in. roller chain, which is protected by a guard. Adjustment is provided for both main and primary chains. The low gear ratio of 18.57 to 1 insures against stalling the motor while starting and enables the machine to get away from any kind of surface or grade.

The wheelbase is the same as the "Scout," 54 in., while the tire size is 26 in. x $2\frac{3}{4}$ in., and used with CC rims. Footrests, adjustable to twelve different positions, are used in place of the regular boards. The fuel tank is of one piece construction carrying approximately 2 gal. of gasoline and 2 qt. of oil in separate compartments. On the electrically driven model the Splitdorf positively driven generator is mounted above the magneto, and is connected to a 6-volt, 80 amp.-hr. battery. Finish is in Indian red with gold striping. Herewith are the prices of the 1925 models.

Indian "Prince".....	Standard.....	\$185.00
	Electric.....	215.00
Indian "Scout"	Standard.....	240.00
	Electric.....	275.00
Indian "Big Chief"...	Regular.....	335.00
Indian "Princess"	Sidecar.....	100.00



The FORUM



Engineers Comment on Choke

Valves and The Fully Developed Car

Editor, AUTOMOTIVE INDUSTRIES:

I regret to note that you are apparently beginning to succumb to the false propaganda against the choke valve which is being circulated for commercial purposes by people who have something else to sell. When a man demonstrates cold starting by feeding through a primer eight to ten times the mixture strength required when the engine is properly warm, that is all well and good; but when the choke is used to give five times the normal mixture strength, that is feeding the engine "raw gasoline," and a terrible thing to do!

Speaking seriously, few people have any idea of the very small percentage of volatile constituents present in present day gasoline at temperatures around zero Fahr. The experiments made at the Bureau of Standards, described by Mr. Eisinger at the recent Summer S. A. E. Meeting, show the tremendous amount of liquid gasoline that must be fed to obtain a combustible vapor at 32 deg. Fahr. Mr. Eisinger found that the least amount, in volume, of fuel that would ignite at 32 deg. Fahr. was ten times that required for the richest mixture that would ignite at 200 deg. Fahr.

As a matter of fact, no carburetor or priming equipment that I know of is able to feed enough gasoline at low temperatures to continuously supply a firing charge of vapor; and we actually start by feeding insufficient charges to the cylinders while the engine is being turned over until enough vapor is accumulated in the clearance space of the engine to give an explosion or so.

In other words, the engine is firing perhaps every twentieth cycle. When a few explosions occur, the engine speed increases and with it the intake manifold velocity so that some liquid fuel drops are drawn up into the slightly warmed cylinders, permitting more or less continuous firing to take place thereafter.

Experiments which we have made indicate that the promptness of starting depends upon the rate at which fuel is fed into the intake manifold and is more or less independent of the method or point at which it is fed; whether injected through nozzles in the intake manifold by pump pressure, sucked in above the throttle from a primer tube or drawn from the main jet of the carburetor with the choker closed, the ability to start depends only on the amount of fuel fed per minute. Very little advantage, if any, is gained by injecting the fuel into the cylinder; unless in the vicinity of the spark plug, with a means of ignition that permits of a succession of sparks to give local heating.

Only a small percentage of this starting charge is burned in the engine and it would really be an advantage if the remainder of it could be thrown away; though most drivers complain of the waste when they see the heavy ends draining through the carburetor from the manifold when a cold engine is stopped. When the half-pint or more of fuel necessary for starting cold reaches the engine cylinders, it is inevitable that the oil on the cylin-

der walls be diluted and washed off by this gasoline; though at this temperature the heavy gasoline ends ought in themselves to be a fairly good lubricant.

After starting, with engine and manifold still cold, it is necessary for a certain time, varying greatly with different engines, to feed a mixture considerably richer than normal, and during that time it is necessary for the driver to use some control giving temporary enrichment of the mixture; with the possible other alternative, unfortunately employed by many, of having the carburetor regularly adjusted much richer than necessary for normal driving.

It is customary to deplore the use of the choke after starting—but it is only a question of feeding a cold engine the necessary rich mixture, or not using the car. In the absence of heat for the vaporization of the charge, the best that can be done is to make the temporary adjustment given by the control one which satisfies the requirements of a cold engine at all speeds and loads.

Experiments which we have recently made indicate that the mixture range requirements of a cold engine are far different from those of a warm engine; that is, enrichment of the warm adjustment by a constant percentage for all speeds and loads will not give the most satisfactory cold engine adjustment.

When makers and users of automobiles begin to realize that the rate of gasoline feed required for starting in cold weather is in the order of pints per minute, they will perhaps begin to search for some means of preheating the intake system. The chief drawback to electrical heating is the fact that so much current is required; 100 amperes at six volts is about the least application of heat that is worth while feeding to a primer, and it is quite certain that larger batteries will have to be fitted when electric means of heating the charge come into use. F. C. MACK.

Research Engineer, Stromberg Motor Devices Co.

Editor, AUTOMOTIVE INDUSTRIES:

I consider that your recent article bearing the title, "Isn't the Public Ready for the Fully Developed Car?" is a very well thought out discussion of automobile design, and I feel that many of the improvements discussed will, in time, be developed and worked into production.

We, of course, know that the public is always ready for an automobile which will give better service, but it is sometimes hard to distinguish between a novelty and something that has real merit. Unfortunately public opinion is often temporarily led astray by novelties. However, it is certainly true that a novelty without real merit will not endure. An automobile to be successful over a period of time must be based on sound fundamentals.

I feel that many manufacturers are carrying forward consistent development work, and that we may confidently look forward to desirable improvements materializing from time to time.

J. G. VINCENT.

Vice-Pres. of Engrg., Packard Motor Car Co.

Exports of Cars, Trucks and Tires for

COUNTRIES	PASSENGER CARS								TRUCKS						ELECTRIC VEHICLES	
	Up to \$500		\$500 to \$800		\$800 to \$2000		Over \$2000		Up to 1 ton		1 to 2½ tons		Over 2½ tons		No.	Value
	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value		
Europe																
Austria					2	\$3,146										
Azores and Madeira Islands	4	\$1,456														
Belgium	16	6,996	32	\$25,746	55	63,184	4	\$9,490	1	\$1,400						
Bulgaria			3	3,288												
Czechoslovakia					2	1,863										
Denmark			1	600	15	15,181										
Estonia					9	9,654										
Finland							5	12,500	4	2,212						
France			1	880			1	418								
Germany	10	4,867	2	1,152	95	125,630	7	21,746	2	1,019						
Gibraltar							1	2,500								
Greece	13	5,608	2	1,446	5	6,983										
Hungary			7	4,564												
Iceland and Faroe Islands																
Italy	178	51,331	2	1,531	3	3,817	2	8,130	55	13,005						
Latvia					2	1,754										
Lithuania																
Malta, Gozo and Cyprus	9	31596	1	632												
Netherlands	2	445	53	39,748	23	31,952	7	20,868	1	374	1	\$1,136				
Norway			20	15,053	4	4,772	1	2,525			1	1,977	1	\$1,533		
Poland and Danzig			2	1,280	10	12,302	1	2,500								
Portugal	11	5,180	7	5,796	18	18,918	1	2,500								
Rumania																
Spain	228	110,283	137	105,888	123	138,404	9	26,840	30	14,785	14	7,951				
Sweden	1	300	77	59,060	72	79,456	7	17,500	2	1,296					1	\$1,570
Switzerland			12	7,999	30	40,544	10	25,000								
Turkey																
Ukraine									1	500						
England	43	18,577	3	2,226	100	107,505	29	94,619	28	15,484	22	26,141	3	5,238		
Scotland			6	3,900	1	1,500	1	3,000								
Ireland	3	1,100	17	12,234	1	902					14	10,063				
Yugoslavia, Albania and Fiume	3	1,501														
North and South America																
United States																
Canada	133	34,028	262	175,147	284	328,286	27	74,248	21	13,323	67	90,344	1	2,000	2	2,357
British Honduras																
Costa Rica	1	475	1	861	6	6,804			2	712						
Guatemala			5	4,305	8	10,861			1	548					1	2,000
Honduras	2	708	3	1,961	4	3,526			1	518					1	1,945
Nicaragua			3	2,410	3	3,284										
Panama	11	4,732	3	2,417	9	10,262			11	4,281	1	1,151				
Salvador	1	500	3	2,583	22	22,468	1	2,500			2	2,612				
Mexico	537	180,654	83	56,799	185	208,354	11	31,037	74	38,792	17	21,588	3	7,460		
Miquelon and St. Pierre																
Newfoundland and Labrador	5	2,101			6	7,709	1	2,458								
Barbados	6	2,994							9	3,292						
Jamaica	19	7,218	4	2,891	6	4,890			10	3,560	2	3,395				
Trinidad and Tobago	15	5,778	3	2,266							1	4,126	1	1,832		
Other British West Indies	9	2,845			3	3,432										
Cuba	611	178,844	69	47,054	100	106,637	19	56,266	179	46,532	7	8,470				
Dominican Republic	57	17,545	11	7,479	7	7,875	1	2,700	14	4,900						
Dutch West Indies					1	982			5	1,798						
French West Indies	1	364							1	452						
Haiti	2	946			6	6,785					2	4,001	1	3,400		
Virgin Islands																
Argentina	207	96,832	82	67,149	171	198,245	10	34,090	6	5,853	13	26,889	17	60,731		
Bolivia					2	3,071										
Brazil	139	42,819	37	29,916	67	81,990	4	10,073	30	7,035					1	1,359
Chile	102	20,887	6	5,057	38	43,149	13	38,240	102	47,312	8	14,694	1	4,583		
Colombia	18	6,518	22	15,499	26	35,801	2	10,000	15	4,940	7	7,804				
Ecuador	3	1,272	3	2,486	7	6,230			6	2,712						
British Guiana			3	2,422												
Dutch Guiana	1	364														
Paraguay																
Peru	17	7,322	23	17,900	41	48,308			72	28,987	53	63,848				
Uruguay	53	17,630	40	30,048	32	39,023	1	2,500	171	33,608	6	7,777	7	15,362		
Venezuela	44	16,906	13	10,860	32	38,531	1	2,411	27	12,145	5	7,181				
Asia																
Aden																
British India	20	9,672	77	57,746	56	62,857	1	2,525	10	8,082	6	7,220				
Ceylon			14	10,478	4	5,453			8	7,380	3	3,829				
Straits Settlements			15	9,921	12	13,150			1	600						
Other British East Indies			4	2,948												
China	29	11,410	29	19,328	5	5,469	2	5,265	10	3,560	2	2,169				
Chosen																
Java and Madura	8	4,760	28	22,095	19	22,126										
Other Dutch East Indies			1	861	6	6,888					2	2,056				
French Indo China	10	4,080							5	1,780						
Hejaz, Arabia and Iraq	42	13,560	2	1,475	1	1,372										
Hongkong					8	9,205	4	10,050								
Japan	14	6,303	22	15,405	44	53,394	2	9,280	4	845	9	14,124	2	4,320		
Kwantung																
Palestine and Syria	66	20,610	24	18,408	18	20,701			2	1,014						
Persia	12	3,552														
Philippine Islands	25	8,900	59	41,980	40	46,353			30	18,980						
Russia																
Siam			1	700							4	4,785	1	5,000		
Turkey																
Oceania																
Australia	1,384	563,004	379	586,530	538	606,561	15	39,108	139	106,833	103	140,643	72	123,247		
Other British Oceania									6	4,715						
French Oceania	4	1,192	3	2,400	3	2,984										
New Zealand	44	23,202	169	113,066	129	146,121	9	22,110	20	21,867	27	37,523	10	19,539		
Other Oceania																
Africa																
Belgian Congo	9	3,140			6	6,425			14	5,264						
British West Africa									18	14,558	6	6,545				
British South Africa	80	38,257	227	175,693	203	221,919	2	6,190	9	5,579	16	19,142				
British East Africa	7	3,855	14	11,159	12	13,176	1	3,443								
Canary Islands			4	2,369	14	17,635										
Egypt	16	7,650	11	8,348	1	877			1	746						
Algeria and Tunis																
Other French Africa	6	2,100	1	815					18	6,778						
Morocco	13	5,128														
Portuguese East Africa			10	3,515	2											

July, 1924

Canadian Exports

PARTS	TIRES						PASSENGER CARS						TRUCKS		PARTS	COUNTRIES
	Casings		Inner		Solid		Up to \$500		\$500 to \$1000		\$1000 and over					
	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.		
\$95										2	\$1,406					Europe
41	42	\$288	100	\$190												Austria
567,304	884	18,456	281	1,210	10	\$320						2	\$2,058		\$2,128	Azores and Madeira Islands
96							38	\$15,012	11	7,488						Belgium
234							4	1,821								Bulgaria
570,324	5,911	56,610	7,400	8,129	30	828			2	1,633					21,121	Czechoslovakia
1,985																Denmark
1,378	597	9,531	830	1,897			1	331								Estonia
270,915	556	10,861	235	780												Finland
3,900	105	1,260	120	187	10	629										France
																Germany
7,068	152	3,224	124	253	231	7,231			8	5,758						Gibraltar
122	30	467	63	116												Greece
982	23	234														Hungary
41,458	340	4,355	70	140												Iceland and Faroe Islands
149	54	800	61	100												Italy
	154	2,302	390	683												Latvia
74	115	1,086	6	8			3	1,381								Lithuania
77,214	1,805	28,727	1,852	4,999					3	1,910						Malta, Gozo and Cyprus
14,249	3,020	40,015	1,695	2,663	64	2,166			26	19,010						Netherlands
2,505	827	12,113	906	1,714					2	1,261						Norway
2,035	516	7,935	2,598	5,531	22	330										Poland and Danzig
273	175	2,392														Portugal
336,938	37	607	12	77	2	23										Rumania
26,473	11,838	152,810	7,583	15,117	8	560						7	8,708		7,388	Spain
5,531	328	7,162	245	795								3	3,354		93	Sweden
144																Switzerland
95																Turkey
296,719	14,959	166,537	9,338	16,796	3,495	67,062	298	92,305	133	120,293	20	22,993	48	\$15,518	7,522	Ukraine
4,972	6	120			49	1,127										England
9,994	86	1,202	394	452												Scotland
108																Ireland
																Yugoslavia, Albania and Fiume
968,871	2,317	35,669	2,140	5,398	90	4,142	13	2,300	2	1,600				15,890	6,545	North and South America
255	28	209	18	45												United States
2,339	130	2,525	132	279	4	110			2	1,815						Canada
2,757	22	344	34	99	8	187			3	2,905						British Honduras
1,383	131	2,677	118	395	22	882										Costa Rica
1,375	11	122	85	146	4	148			1	646						Guatemala
9,826	712	9,286	289	593	36	715										Honduras
5,506	292	5,340	620	1,083												Nicaragua
100,405	9,581	109,825	9,660	16,167	289	8,252			16	11,891	5	1,341			42	Panama
												5,500			33	Salvador
1,591	245	2,858	181	303	3	70	6	2,744	1	968						Mexico
4,249	47	643	56	101	4	143			1	972						Miquelon and St. Pierre
9,122	221	2,268	271	343			5	2,108								Newfoundland and Labrador
6,114	146	2,279	95	206												Barbados
3,507	236	2,730	380	642	22	803	1	419								Jamaica
114,858	5,681	76,135	16,712	29,917	956	25,835			1	704						Trinidad and Tobago
14,011	1,595	16,744	2,762	4,807	60	2,327	3	1,440								Other British West Indies
1,510	207	2,291	394	688	2	30	1	486	2	1,253						Cuba
2,894																Dominican Republic
5,797	166	2,103	623	977												Dutch West Indies
678	46	520	44	90												French West Indies
612,915	4,376	54,555	6,058	9,013	218	5,687	82	37,666	14	12,037	46	57,454				Haiti
	16	257	28	70					2	1,632						Virgin Islands
408,740	2,117	18,134	274	570	38	1,947	22	10,341	83	67,844	22	24,361				Argentina
24,716	1,089	17,910	276	722												Bolivia
20,833	843	14,301	1,642	3,128	44	1,168										Brazil
4,117	224	1,869	355	636	4	119			2	1,232	1	1,240				Chile
1,460							9	3,478	1	804						Colombia
16																Ecuador
	82	1,215	124	168												British Guiana
25,453	1,977	30,867	1,850	3,758	70	3,160			1	645	6	7,336				Dutch Guiana
5,782	950	13,284	508	1,210					14	81943	2	2,030				Paraguay
9,208	1,266	17,783	2,458	4,175	12	162	2	891	2	1,140						Peru
																Uruguay
150																Venezuela
28,519	1,278	19,448	634	1,613	87	1,332	695	249,950	34	21,521	13	13,169	4	1,304	122	Asia
3,460	203	1,880	127	215	20	493	40	15,625	8	5,286	1	1,086	220	74,403	14,088	Aden
27,361	1,767	21,880	1,700	2,849	44	726	167	52,820	2	1,004			80	31,082	3,954	British India
													36	11,926	23,452	Ceylon
17,510	364	4,814	255	594	26	588	7	2,996								Straits Settlements
947									1	587						Other British East Indies
19,223	997	11,960	375	418	199	5,296										China
3,572	168	2,016			49	810	227	73,265	6	3,240	1	1,358	75	25,081	11,328	Chosen
231																Java and Madura
2,077																Other Dutch East Indies
1,086							4	1,724								French Indo China
47,954	2,334	18,774	2,434	3,482	166	3,657			4	3,178						Hejaz, Arabia and Iraq
265	60	875	107	150												Hongkong
10,348	678	8,346	659	1,059			3	1,450								Japan
43	8	95	204	319												Kwangtung
36,659	7,263	105,983	6,624	12,938	562	12,942										Palestine and Syria
																Persia
1,583	115	1,297	75	127	16	370	6	1,430								Philippine Islands
127																Russia
218,738	4,607	65,299	2,618	7,867	525	15,008	250	78,500								Siam
779																Turkey
1,672	52	533	33	38	10	760										Oceania
68,904	7,291	109,992	5,140	9,693	728	30,013	546	213,615	146	97,936	28	31,338	110	40,921		

Here and There in Foreign Markets

By special arrangement with the Automotive Division, Bureau of Foreign and Domestic Commerce

Many Buses Operate in Spain

THE development of autobus routes in the province of the Seville has kept pace with the increasing number of motor vehicles in which Seville now ranks third in Spain in registrations.

Autobus service now extends to twenty towns and villages ranging from five to one hundred kilometers from Seville. There is no doubt that great economy of operation would result if many of the present competing lines on the same routes were consolidated into one or two regular services, but there has been no attempt on the part of the local capitalists to organize a bus company to operate extensive routes. However, in spite of the great depreciation on the buses, together with the high price of gasoline, the bus fares are low enough to be within the reach of all classes of passengers. The average fare is one cent per mile at present rates of peseta-dollar exchange.

Excess of Trucks in Japan

AS a result of heavy Government purchases following the earthquake last September, the truck and bus market in Tokyo is now reported in a very depressed condition. Bus services inaugurated by the Government because of the breakdown of the trolley system are being discontinued, and large numbers of buses have been offered for sale. A recent cable states that efforts are now being made to dispose of further stocks outside the city. Further evidence of this condition is seen in the fact that the United States exported only 13 trucks to Japan during the month of July.

Terms Offered Polish Agent

THE acting Commercial Attache at Warsaw reports the efforts of a dealer in Warsaw to secure the agency for a medium-priced American car as an example of the difficulty of doing business at the present time. The local dealer advised that he was unable to get an American bank to accept a Polish bank's guarantee, and in consequence the only terms upon which he could take the representation are 25 per cent down, with shipment of car, and the balance in three months, this balance to be guaranteed by a Polish bank. To date the American firm has not accepted this proposition.

Low-Priced Cars Selling in Cuba

INCREASED sales of a low-priced American car, selling in Cuba for between \$500 and \$800, is reported by the Trade Commissioner at Havana as the result of a more liberal arrangement in the matter of financing. The original terms of \$300 down and the balance in six months, have been extended to \$200 down and the balance in eight

months. This resulted in such an increase in sales during the month of July that difficulty was experienced in securing sufficient cars to meet the demand. The dealer reports that although sales since last October have amounted to more than 1400 cars, he has had to repossess but four machines. The reason which he gives for this successful record is that he never surrenders the title of ownership to the cars which he sells until full payment has been made.

Canadian Exports to New Zealand

THE dominant position which American makes of cars and trucks hold in New Zealand is shown by the fact that Canada accounted for 60 per cent of the motor vehicles imported into New Zealand in 1923, and the United States for 35 per cent, compared with 4 per cent for the United Kingdom and 1 per cent for Italy. The proportions have steadily increased in recent years in favor of the United States and Canada. In 1922 Canada supplied 53 per cent and the United States 36 per cent, compared with 8 per cent for the United Kingdom and 3 per cent for Italy. These percentages are, in general, borne out in the case of Auckland, where 1054 of the total 1468 vehicles imported came from Canada, 290 from the United States, 53 from Britain and one from France. The proportion of closed models imported into New Zealand is steadily increasing, rising from 93 in 1922 to 723 in 1923.

Hungarian Market Growing

IMPORTS of automobiles into Hungary during the first quarter of 1924 amounted to 304, a decided increase over the corresponding period of the previous year in which only 47 cars were entered. Italian, French, Austrian, and German cars predominate and American imports rank fifth in importance.

Organizing Show in Melbourne

THE Chamber of Automotive Industries, in conjunction with the Royal Automobile Club of Victoria, Australia, is organizing a large automobile show to be held in Melbourne about the middle of 1925. It is to be international and profits accruing from the display are to be divided among the exhibitors.

Danish Imports

IMPORTS of automobiles into Denmark during the first six months of 1924 amounted to 1558, as compared with 3538 for the same period in 1923, and motorcycle imports were 152, which show a decided decrease from last year's figures amounting to 421.

~ Editorial ~

Uniform Traffic Laws

LACK of uniformity in regulations and in the collection of statistical data are among the chief causes of traffic accidents. This was one of the first major discoveries of sub-committees working as part of the recently formed Hoover movement to decrease the hazards of traffic. Other investigators discovered the same thing several years ago, but the rediscovery by so important an agency as the Hoover committee is of real importance because new strength will be given to efforts toward standardization which is so much needed.

Divergence in state laws is so wide at present that a driver may do something which is well within the law in one state and, a few minutes later subject himself to the danger of fine or imprisonment by performing the identical act in another state. A driver does not need to be reckless or even careless to disobey some regulations under present conditions. The rules which have been set up by various states and municipalities differ so greatly that only a very careful investigator can hope to know all the edicts of all the towns through which he passes.

Consequently, the Hoover committee, with the power of a great name and of an able personnel, has before it an opportunity for untold practical achievement. The extent of its accomplishment will depend largely on the sincerity and activity of the support given it by the public in general and by the automotive industry in particular. Such support already is being given and can be expected to continue so long as the traffic problem remains perplexing.

Bus Fire Hazards

SERIOUS accidents have occurred recently due to gasoline fires which have trapped and burned the occupants of buses presumed to be reasonably safe. In one case, involving an American chassis with improvised body, used in England, no less than seven passengers lost their lives, while seven others out of a total of seventeen occupants were injured seriously. This was a front entrance vehicle but had an emergency rear door which, like many others, was masked by a tip up seat, and had a latch operable only from the inside.

The fire occurred while the fuel tank, which was under the driver's seat, was being refilled from a separate emergency supply tank, and the rush of flame and ensuing panic followed so rapidly that the emergency exit was not used. It is doubtful whether the passengers knew of its existence or could have opened it quickly enough if they had known. Even then there would have been a drop of about four feet to the ground.

It is clear that the fuel tank never should be placed inside of a bus body and there is reason to question the wisdom of filling even an outside tank when passengers are occupying the vehicle. Front floor and toe boards should be made of or covered with fire-proof material.

Front entrance buses should have an emergency exit either in the rear or near the rear at the side opposite to that in which the front entrance is located. This should be marked plainly and so designed as to be opened easily and quickly but without danger of accidental opening or jamming. Probably the opening should automatically lower a step to facilitate exit.

Gravity feed of fuel has certain advantages from the standpoint of simplicity, but this should not stand in the way of provisions for safety, since safety always must be a paramount consideration in the design of any vehicle.

One-Piece Windshields

ONE-PIECE windshields are not a new thing in the passenger car industry, but they promise to become more popular in the near future because they afford, at least under most conditions, a clearer vision than is obtained with the two-piece type. Even though the rubber dam be omitted from the latter, the joint in the glass obstructs vision in the plane of the slot and the eyes of the driver.

Advocates of two-piece construction claim that it affords possibilities of better ventilation and makes it possible to drive in a storm with the shield partly open to give a clear vision slot and still avoid entrance of sufficient water to be unpleasant. It also permits of using the car during the rare occasions when sleet or snow freeze on the shield as they fall and cannot be removed by a windshield wiper.

On the other hand, it is claimed by those who prefer the one-piece shield that ventilation is secured easily by other means and that clear vision is obtained in practically all cases by use of a good wiper. Furthermore, a one-piece shield can be made to open wide enough for clear vision in an emergency, although it then might admit more rain than is comfortable. Also it is difficult to exclude rain with a two-piece shield, even when a rubber dam is used at the joint.

At least one or two concerns are using fixed one-piece shields on closed cars. They are said to save some expense in manufacture, though extra ventilators above the upper glass are employed, to give clear vision under practically all conditions when a wiper is used and to exclude rain better than any adjustable type. It seems likely that more such shields will be seen at the coming shows.

Our Industry Today—

Sales Volume Disappointing First Part of Month, Pick-Up in Operations Will Hinge on Retail Improvement

NEW YORK, Sept. 22—Failure of sales volume to increase in keeping with anticipations is likely to halt any contemplated movement forward in automobile production schedules. Unless there is improvement in demand before the end of the month, there probably will be some curtailment in operations. If this curtailment is not great, September output of cars and trucks will reach or surpass the August figure, owing to the increase in Ford production.

Conditions are not alike with all producers. A few manufacturers continue on high schedules, with operations close to capacity, but the majority are experiencing the usual September lull in demand, with no upward swing from the level maintained during the summer and, in keeping with their policies, are regulating their production programs accordingly. Ford is an exception to the general situation, reports indicating a steady increase in retail sales.

Parts makers are reporting somewhat better business but there are no strong expectations that the improvement will reach any marked proportions before the beginning of the year. Their operations will depend upon the retail sales reports reaching car and truck manufacturers. There has also been some improvement in demand for steel sheets, its continuance likewise depending upon retail sales of motor vehicles.

Sales Conditions Vary

Sales conditions vary in different sections of the country. Reports are received from some districts that there is a pressing demand for cars, with a resultant increase in dealer orders. One maker describes business in the Central West, including States between the Mississippi and the Rocky Mountains, as particularly good. On the whole, however, business is being held back either by local conditions or the general economic situation. The latter is regarded as a ruling factor.

Dealer stocks continue at a low point and tighter lines have been drawn on manufacturing operations, both for the present and the future, to guard against the overstocking condition of the spring. The attitude taken by General Motors of balancing production and sales is being adopted by other producers and similar policies are being put into effect.

Tire production is at a high point, with no signs at present of any movement toward lower schedules than are now in force.

TOLEDO EMPLOYMENT GAINS

TOLEDO, Sept. 22.—For five consecutive weeks employment in Toledo plants, including the larger automotive factories, has shown a gain, and there are now

at work about 65 per cent of the peak established in early August of last year.

Plants which have been on short time are also increasing hours, and many have joined the full-time group.

Farmers in Illinois in a Buying Mood

Rural Sections Report Increased Interest in Motor Cars Following Good Crops

CHICAGO, Sept. 22—In view of conditions automobile production in this district is proceeding at a very satisfactory pace, with prospects for gradually increasing schedules, held to the level of retail demand, and with indications of improved markets on the road ahead continuing to accumulate. Factory executives are considerably encouraged by evidences of a steady strengthening of general business conditions throughout the country, while it is well established now that prosperity of this section is on a healthy upgrade.

From all parts of the State of Illinois come reports to the effect that farmer interest in motor vehicles is quite noticeable, rural dealers with whom business from this source has been a substantial nullity in recent months accounting finally for some farmer sales, which it is believed will increase in volume as more of the present year's crops are converted into cash.

Farmer In Market

Another indication that the farmer is beginning to spend money again is found in increased activities in implements and tractors. Plants engaged in such operations have been adding to employment rolls slowly and going ahead with the same precaution noted at automobile factories, but according to reports from Moline and other implement and tractor centers it is expected that more material enlargements of activities will be witnessed within the next few weeks.

In practically all branches of commercial life conditions are improved. The

employment decline in Illinois is considered a matter of history as far as this year is concerned, automotive establishments contributing measurably to the betterment.

Automotive production in numbers of cases has been held back somewhat for the lack of materials, car makers being affected along with certain of the allied concerns. Materials necessary in body making compose one of the complications in this connection, the condition not only retarding the volume of body production that otherwise would be possible, but causing a check in some automobile factory deliveries to a certain though limited degree. This is a situation, however, that will look to its own adjustment as the supplies of materials required by the body makers increase to the level of demand.

Stocks Have Dwindled

Supply stocks of nearly all kinds demanded in automotive manufacturing, as well as in most other production lines, have logically dwindled as a result of the lull. On the whole, automotive manufacturers of this zone are able to obtain all supplies necessary to their present output schedules. While cars are being produced in increasing quantities, and while allied production is showing signs of steady improvement, although slow, the industry holds consistently to the policy of meeting only the spot demand.

Cleveland Plants Busy Meeting Fall Car Demand

CLEVELAND, Sept. 22 — Reports from the Jordan offer the greatest encouragement in the automotive field for the Cleveland district during the last week. Jordan production of the Great Line Eight is now said to be running at about 40 cars a day. This output, it is asserted, is being absorbed immediately by orders on hand, and goes to fill actual sales. While the sale of the six cylinder cars is said to be good, yet the bulk of attention at the present moment is going to the new models.

Rollin reports that its output is being taken up promptly by distributors, and that the demand is running at about the same level as during the two previous weeks. Cleveland officials state that their business is operating on a satisfactory demand and is about normal. Sterling-Knight asserts that its business has been more active than at any other time.

In Akron it is claimed that the predictions of rubber men that the fall season would see almost a boom demand for tires is coming true. Regardless of whether the inquiry is made of the small or the large producers, the report comes back that plants are having about all they can do to meet the present output schedules which have been set up.

Ford Increasing Production Pace

Cotton Crop Outlook Encourages Dealers

Southern Indications Point to Good Fall and Early Winter Business in Automobiles

ATLANTA, GA., Sept. 23—Cotton prices at the principal spot markets of the South have declined several cents during the past month, the present quotations generally averaging around 22 cents, compared with a price of almost 30 cents a pound prevailing a month ago.

The reason for this, however, is not due to adverse conditions at all, but because of the fact that favorable growing conditions of late have greatly increased the size of this year's crop, which, in spite of boll weevil conditions, will likely amount to around 13,000,000 bales, almost 2,000,000 bales larger than the earlier estimates given some two or three months ago.

Therefore, the increase in the size of the crop serves to more than offset the drop in prices, and the situation is substantially the same as it was at the time when prices were around the 30 cents per pound level.

Southern Demand Increasing

The truth of this is being already evidenced in the automotive field, Atlanta distributors handling the medium, lower priced and better known makes of automobiles, advising that since the first of this month there has been considerable interest displayed by dealers in nearly every section of the South over the fall and early winter outlook, and that many of these dealers have expressed the opinion that they will enjoy as good fall and early winter business this season as in some three or four years past. In districts where the cotton crop is unusually good dealers are beginning to outline requirements for the allotment during the last three months of the year in excess of any late year period since the inflation era that immediately followed the World War.

Accessory jobbers here state that the situation also is being noted among retailers in that field as well, who are taking fall and holiday stocks generally larger than at any time in three years.

Optimistic Note Sounded by Big Milwaukee Bank

MILWAUKEE, Sept. 22—"There is more activity in motor parts and equipment corresponding to increased automobile production and the bringing out of new models by the large makers," says the current issue of Business and Financial Comment, the largest local

bank's review, in noting a moderately improved business situation in Milwaukee during the past month.

"August proved to be a good month for tire sales and production," the summary continues. "Industrial employment as a whole turned upward. Substantial sales of leather were made at somewhat firmer prices."

The tone of the Sept. 15 issue generally is more optimistic than it has been in about a year.

The Week In the Industry

The flow of new models continued unbroken last week. Companies announcing new lines or model changes in the last seven days include Moon, Cleveland, Maxwell and Chevrolet. Dodge Bros. has cut \$60 off the price of four special models, thus furnishing the only important divergence from the trend toward price increases which is general just now.

Progress was made toward settlement of the affairs of several companies which have figured in the financial news lately. The trustee of Columbia Motors Co. has given it as his opinion that the plant and property should be sold at once, while Templar Motors has been taken over by the Guardian Savings & Trust Co. as trustee under the \$1,000,000 mortgage given some time ago under reorganization plans. The new management of Kentucky Wagon Manufacturing Co. is negotiating for a controlling interest in the stock of the Continental Car Co. of America. The car company would continue as a separate unit after the merger, it is understood, but will cooperate closely with the wagon company.

The new Durant sales organization has announced abandonment of distributors and adoption of a direct dealer selling plan.

Important conventions last week were the S. A. E. automotive transportation meeting, held in New York, and the Automotive Electric Association gathering at White Sulphur Springs, Va.

Insurance men have voiced a strong protest against compulsory automotive insurance. Their expression of opinion came at a convention of National Association of Insurance Agents in Milwaukee. This opposition is not new, however, as it has been known for some time that most insurance interests are opposed to such legislation, because, among other reasons, they do not want the state to get into the insurance business and feel sure that compulsory automobile insurance would be certain to bring about such a result.

Detroit Expecting Increasing Demand

Factories Planning to Care for Generally Improved Market From Now On

DETROIT, Sept. 25—Preparations are being made in the factories for increased production in the face of a gradually increased demand for cars from many points in the country in the last few days. Sales officials are not looking for any large business coming at any one time, but there is expectancy of a generally improved market from this time on, and factory facilities are being shaped up to meet it.

The Ford Motor Co. is experiencing a considerably increased business, and production schedules have been increased. Many of its dealers are reported to be entirely out of cars and have orders that are temporarily held up while awaiting deliveries. Dealers in many parts of the country are reported driving cars away from assembly branches to hasten their deliveries. This increased business is coming from both the agricultural and industrial districts, the former demand being somewhat larger.

Activity in Lansing

Visiting the Lansing properties of the Durant company, W. C. Durant and a party of officials advised the officers of the Lansing plant to be prepared to meet a much better sales demand during October than during the present month.

Better business has increased the operations of the three major car producing plants in that city, Reo maintaining a high output of its cars and commercial vehicles, Olds being busy on production of its new coach and other closed models, and the Durant plant finding generally increased demand for the Star models.

Reo is shipping a trainload of its cars to its Boston distributor today, the third this month. Business in the eastern territory generally is reported heavier in September than recently, and the company also reports much better business in the wheat and cotton growing States. Reo dealers in these sections are reported by the factory as looking for good business throughout the fall and winter.

With the exception of dealers handling several of the leading lines, there are no stocks of cars on sales floors. Distributor and factory branch stocks are comparatively low, and dealers are drawing cars only as they need them for immediate deliveries. The condition amounts to a practical shortage of cars throughout the country, so that when renewed buying comes, manufacturers will have to resume large schedules immediately.

Templar Taken Over by Bank as Trustee

Another Effort, It Is Said, Will
Be Made to Put Company
on Operating Basis

CLEVELAND, Sept. 24—Templar Motors has been taken over by the Guardian Savings & Trust Co. as trustee under the \$1,000,000 mortgage given some time ago under reorganization plans. The bank took this action when the company defaulted in the payment of interest.

Operations at the plant, which is one of the best equipped for the manufacture of automobiles in the city, ceased some time ago because of lack of working capital. When Templar was reorganized additional subscriptions were solicited from stockholders with a view to providing working capital and to giving the stockholders an opportunity to save their investment. A large number of the stockholders resided in Pennsylvania and under the blue sky laws of that State company officials could not solicit subscriptions from them.

Approximately \$500,000 of new capital went into the new Templar company, which was headed by T. L. Hauserman, who has been active as receiver. It is stated that another effort will be made to put the company on an operating basis.

Templar sprang into existence during the days of the late war. About the time that the company got its plant built and was ready to go into production of automobiles the Federal order for the curtailment of the production of non-war essentials was issued, and the company went into the manufacture of munitions for the Government.

Quarrels Hampered Operations

The war over, the Templar organization went into the production of automobiles. Then commenced a long and bitter warfare with men who had been active in selling stock and had been let out. The latter stirred up minority stockholders, and the resultant quarrels interfered with the production plans of company executives.

M. F. Bramley of this city, then president, by heroic measures had \$750,000 of new capital put into the company at one time and saved it. Later came the dull days of 1921, and a receivership was deemed necessary, with T. L. Hauserman as receiver. Plans for the production of a six-cylinder car, with the continuance of operations on the four-cylinder car, were announced. Stockholders put in an additional \$500,000 for the reorganization, with Mr. Hauserman heading the new company, which has just suspended operations.

PLANS GREATER STAR OUTPUT

SAN FRANCISCO, Sept. 24—Plans for the Pacific Coast factory that con-

template a big year have been put into effect by Norman de Vaux, president of the Star Motor Co. of California, who has just returned from New York, where he attended a conference of executives of the Star and Durant companies. An immediate increase in production is announced by de Vaux, who said that the demand for cars by the dealers make this move imperative.

Splitdorf Gets Praises from Court of Chancery

NEWARK, N. J., Sept. 22—Following the refusal of the Chancery Court of New Jersey to appoint a receiver for the Splitdorf Electrical Co. and the prompt dismissal of the Halsey suit, President M. W. Bartlett has issued a statement to the industry in which he quotes a portion of the decision of the Vice-Chancellor, who says:

This company is not insolvent in any bankruptcy sense. It is paying all its bills and doing a regular business. It has been losing money. Yes, but that happens to many firms and it seems that the Splitdorf concern lost mainly through an excess of patriotism during the war, when instead of reaping profits they chipped in and helped the government. No potential insolvency appears, for their business prospects are good and they have the strong support of both their stockholders and the banks.

Peerless Position Good Despite Dividend Action

CLEVELAND, Sept. 24—Although Peerless Truck & Motor Co. of this city in September passed payment of the current dividend, directors say that the company is in exceptionally strong financial condition. The present status of the automobile industry and business in general prompted conservation of the corporation's funds.

Peerless entered into the year 1924 after having passed through costly litigation. It also ran up its expense of production by bringing out a new six-cylinder car. The marketing of that car, with the expense of advertising it, were items that are said to have entered into the decision to pass the last dividend, although reception of the Peerless six has been very generous.

Steidle Making Plans Toward Reorganization

CINCINNATI, Sept. 24—James R. Clark, recently appointed receiver of the Steidle Manufacturing Co., has retained the services of the principal Steidle executives to assist him in continuing the business.

The receiver decided to discontinue the manufacture of radiators, except as to filling orders already on hand and for making any necessary adjustments of past sales. It is hoped by Steidle executives that the receivership will be terminated at an early date, so the company may reorganize and manufacture "Add-A-Bin" units, which is one of their new lines.

Trustee Favors Sale of Columbia Motors

Referee and Creditors Agree and
Permission of Court Will
Be Sought

DETROIT, Sept. 20—Following appointment of Security Trust Co. as trustee in bankruptcy for Columbia Motors Co., representatives in court this week stated that the trustee believes it advisable to sell the plant and property immediately that the expense of maintaining it may be terminated as quickly as possible. The referee and creditors concurred in this opinion, and application for permission to sell is expected to be made to the court within a few days.

The appointment of the trustee in bankruptcy followed its appointment recently as receiver in bankruptcy. The inventory and appraisal of the property filed by the trust company showed assets under inventory to be \$1,962,505, which were reduced by the appraisers to \$997,455 as the sound value of the property as a going concern. Statement of assets and liabilities prepared by the receiver showed liabilities to be \$863,559, without giving effect to any capital liabilities or the commitments of the company.

Commitments for materials, supplies, etc., are indicated by the receiver to be approximately \$785,000.

Final August Figures Put Output at 269,115

WASHINGTON, Sept. 24—Department of Commerce figures place August production of cars and trucks at 269,115.

The revised figures of the department for all of last year and for eight months of this year follow:

PASSENGER CARS			
	1924	1923	
January	287,353	223,822	
February	336,371	254,782	
March	348,356	319,769	
April	337,045	344,661	
May	*279,455	350,460	
June	*217,935	337,442	
July	*237,668	297,413	
August	241,631	314,431	
September		298,964	
October		335,041	
November		284,939	
December		275,472	

TRUCKS			
	1924	1923	
January	28,925	19,732	
February	31,156	22,173	
March	34,118	35,284	
April	36,158	38,085	
May	*33,415	43,730	
June	*27,882	41,173	
July	*25,235	30,692	
August	27,484	30,872	
September		28,578	
October		30,139	
November		28,073	
December		27,762	

*Revised

Moon Line for 1925 Includes 13 Models

Carry Four-Wheel Brakes, Balloon Tires and Disk Wheels
Standard Equipment

ST. LOUIS, Sept. 24—Moon's line for 1925 will include 13 models, all of which will carry Lockheed four-wheel brakes, balloon tires and disk wheels as standard equipment. All will be equipped with six-cylinder Continental engines, while all but one will carry bodies seating five passengers. Duco finish is used on all models.

Models known as Series A have 113 in. wheelbase and are priced as follows: Phaeton, \$1,395; roadster, \$1,450; two-door sedan, \$1,695; four-door sedan, \$1,795.

"Newport" models have 115 in. wheelbase and list as follows: Phaeton, \$1,695; four-passenger coupe, \$2,035; sedan, \$2,095; petite sedan, \$2,245.

"Metropolitan" models are mounted on 118 in. wheelbase chassis and include a phaeton at \$1,695; a sedan at \$2,135, and a petite sedan at \$2,245.

There are two "London" models on 128 in. wheelbase, a phaeton and a petite sedan listing respectively at \$2,095 and \$2,885, f.o.b. St. Louis.

Frames have been stiffened with additional gussets, and the Ross cam and lever steering gear, used formerly on only one model, now is standard on all. Radiator and body lines characteristic of Moon cars for some time are retained. Closed cars are trimmed in gray broadcloth. The two-door sedan has a gray satin finish body with black superstructure.

The Series A roadster seats five persons, two beside the driver and two in a folding seat in the rear deck. The rear curtain can be removed easily, thus eliminating the "partition" between front and rear seats when the latter is in use, or the whole top can be folded back without interfering with occupants of rear seat. The body of the roadster has a gray finish and Spanish leather upholstery.

A permanent top is fitted on the Series A phaeton. Curtains open with the doors and have flush type fasteners. Trimming is in tan Spanish leather, and the standard body color is marine blue with black molding at belt line.

Coach Listing at \$695 Produced by Chevrolet

DETROIT, Sept. 23—Chevrolet Motor Co. is now in production of a new coach model which lists at \$695, the body of which is by Fisher on the regular Chevrolet chassis. The body construction conforms to that in other Chevrolet closed models, with all panels in steel, and is finished in black with gold stripe.

Door openings are 29 in. wide, with rear quarter windows of the same width as the door window. The driver's seat

is stationary with a folding seat to the right and the rear seat is for three persons. Seats and cushions are upholstered in striped taupe wool cloth, and the sides, doors and head-lining are in mottled taupe of the same material. Floor carpet matches the upholstery.

Windows are operated by Ternstedt regulators. There is a dome light and a satin curtain is mounted on the rear window.

Deliveries Being Made of New Apperson Models

KOKOMO, IND., Sept. 22—Apperson is this week starting deliveries of its new series six and eight-cylinder Jack Rabbitt models. Aside from the addition of balloon tires and ventilating eaves, the eight remains practically as before and the price is unchanged. This really amounts to a price reduction, inasmuch as the balloon tires are included in the price.

A coupe has been added to the six-cylinder line and minor refinements and additions to equipment have been made. The six-cylinder radiator has been changed to the style used on the eight. Balloon tires, disk wheels, bumper, snubbers and many other extras are included as regular equipment on the Six phaeton. Prices have been revised as follows on the Six:

	Old Price	New Price
Sport phaeton.....	\$1,600	\$1,695
Coupe	1,985
Sedan	1,995	2,095
Sport sedan.....	2,195	2,295

Maxwell in Production on New Commercial Car

DETROIT, Sept. 22—The Maxwell Motor Corp. is in production on a new commercial car mounted on the standard car chassis which is slightly altered to meet the requirements of commercial car work.

The new car will come in three body types—screen side and high and low panels. The screen side lists at \$887 and the panel bodies at about \$40 less. The truck complete with body is now being shipped to dealers.

2 New Closed Car Models Added to Cleveland Line

CLEVELAND, Sept. 23—Two new five-passenger closed cars have been added to the Cleveland 1925 line, a four door sedan de luxe and a brougham.

Both cars feature a nicked radiator shell, winged cap, Moto-Meter, trunk rack and platform bars. Another feature is a one-piece ventilating windshield, which consists of a single glass sliding vertically together with an auxiliary air duct in the cowl for ventilation.

NOT WITH BONNEY FORGE

ALLENTOWN, PA., Sept. 24—Announcement is made by the Bonney Forge & Tool Works that Raymond Greeby is not in any way connected with its sales organization.

Durant Abandoning Distributor System

Adopts Direct Dealer Selling Plan
Under Direction of Wholesale Offices

NEW YORK, Sept. 22—A change in sales policy has been made by Durant Motors, Inc., which has resulted in the abandonment of the distributor system and the adoption of direct dealer selling connections for the Star and Durant at all centers of population. The latter will be under the direction of wholesale offices, which in turn will be under the control of Colin Campbell, vice-president in charge of sales and production.

Already 11 of these wholesale offices have been established—at Atlanta, Boston, Cincinnati, Chicago, Dallas, Denver, Elizabeth, Kansas City, Philadelphia, Pittsburgh, St. Louis and Lansing—all of them being east of the Rockies. At a few points the old distributorships continue in force for the time being because of local conditions which require some time to work out.

While most of the distributorships have been cancelled, a majority of the old distributors have continued as direct dealers, operating in and around their various cities and in accordance with the new policy.

Territory Thoroughly Covered

In his new work, Mr. Campbell is bringing with him the policy he developed when with Chevrolet—that of direct dealer representation. He believes that direct selling connections enable the manufacturer to be sure that every square mile of territory is covered with selling and maintenance facilities, which, he believes, is essential in marketing low-priced transportation, the low prices of which are based on volume.

In making this change, Mr. Campbell announces that production schedules are and will be based on a careful study of the retailing power of the dealers and that there will be no overstocking of the retailers. A new selling memorandum which has been adopted provides for alterations of shipping orders on a materially satisfactory basis to meet unexpected economic conditions.

Another new policy adopted by Mr. Campbell is the reduction in the number of body types and options.

Mr. Campbell declares that in spite of the reorganization work that has been done in the last six weeks, orders are mounting at a very satisfactory rate.

LANCHESTER SETS RECORD

LONDON, Sept. 15 (by mail)—At Brooklands Track a six-cylinder Lanchester with a single-seated racing body has beaten 27 world's records, most of which have been standing since 1913. In 12 hours 1148 miles 843 yd. were covered, an average of 95.66 m.p.h. (old record 89.85 m.p.h.).

New Merger Pending for Kentucky Wagon

Company Reported to Be Seeking
Control of Stock of Conti-
nental Car Co.

LOUISVILLE, KY., Sept. 24—Controlling interest in the stock of the Continental Car Co. of America is being negotiated for by the new management of the Kentucky Wagon Manufacturing Co., which withdrew recently from Associated Motor Industries.

The car company will continue as a separate corporation after the merger, it is understood, but will cooperate closely with the wagon company. The combined concerns, according to the report, will produce automobile trucks and truck bodies only.

Reorganization of the wagon company is expected to be completed in about 30 days.

The merger is admitted to be pending, but has not reached a point where a definite statement can be authorized, according to Albert Latta, president of the car company. Arthur Board, president of the wagon company, now is in Philadelphia on business related to the combination and reorganization.

General Motors Elects Fishers as Directors

NEW YORK, Sept. 25—Three additions were made to the board of directors of the General Motors Corporation at the meeting of that body this afternoon. They are George Whitney of J. P. Morgan & Co., and Charles T. Fisher and Lawrence P. Fisher of the Fisher Body Corporation.

In addition Mr. Whitney and Fred J. Fisher were added to the finance committee, which was increased to twelve members, so that it now consists of J. J. Raskob, chairman; G. F. Baker, Jr., Donaldson Brown, H. F. duPont, Irene duPont, Lamont duPont, P. S. duPont, Fred J. Fisher, Seward Prosser, A. P. Sloan, Jr., E. R. Stettinius and George Whitney.

Another important action was increasing the executive committee of the corporation to ten members, the additions consisting of H. H. Bassett, president of the Buick Motor Car Co.; Donaldson Brown, vice-president in charge of finance; John L. Pratt, vice-president in charge of accessory companies; Lawrence P. Fisher and Charles T. Fisher.

Others on the executive board are A. P. Sloan, Jr., P. S. duPont, Fred J. Fisher, C. S. Mott and J. J. Raskob.

HODGMAN RUBBER RECEIVER

NEW YORK, Sept. 24—James Newton Gunn, former president of the United States Tire Co., is one of the two receivers for the Hodgman Rubber Co. of this city, appointed by Federal Judge A. N. Hand.

Business in Brief

Written exclusively for AUTOMOTIVE INDUSTRIES by the Guaranty Trust Co., second largest bank in America.

NEW YORK, Sept. 24—Further evidences of improvement in business conditions become apparent from week to week. In part, the present expansion is due to seasonal factors. A reaction from the summer dullness is likely to appear at about this time. The best reports come from the Middle West, where crop marketing under favorable conditions is an important factor, especially in retail trade.

Car loadings in the week ended Sept. 6 numbered 920,979, or only 7937 below the total for the corresponding period of last year. Loading of grain and of miscellaneous freight were the largest ever recorded in a similar period.

Cotton spinning in August, as measured by active spindle hours, showed an increase of 4% per cent as compared with July. The total for last month was 5,399,549,661, comparing with 5,157,779,726 in July and 7,569,061,615 in August, 1923. Many southern cotton mills are reported to have resumed active operations after having followed reduced schedules for several months. Some have even adopted night shifts.

Building permits in 173 cities in August, as reported to Bradstreet's, represented a total expenditure of \$242,423,965, as against \$229,244,346 in July and \$240,508,554 in August a year ago.

The production of electricity by public utility power plants in July totaled 4,598,541,000 kilowatt hours, comparing with 4,552,603,000 in June and 4,536,401 in July, 1923. The average daily output, however, was slightly decreased, amounting to 148,300,000 kilowatt hours, or about 2 per cent less than in June.

Fisher's index of wholesale commodity prices was slightly lower last week, standing at 147.3 as compared with 149.7 in the preceding week and 147.9 two weeks before. Bradstreet's food index also showed a slight decline to \$3.26 from the figure of \$3.27 in the preceding week.

The suit is a friendly one, brought by the Garfield Paper Box Co., which alleges that, although the company has assets of \$2,500,000 against liabilities of only \$1,100,000, that it is unable to meet its current obligations. The Hodgman company does not make tires, but is one of the oldest rubber manufacturers in the country.

Industry to Appeal Tax Interpretation

No Definite Understanding Is
Reached During Conference
with Officials

WASHINGTON, Sept. 23—The promise of a reconsideration of some of the interpretations of the excise tax regulations drafted by the Revenue Bureau was the result of the conference with Federal tax officials today, in which the automotive industry was represented by Alfred Reeves, R. A. Brannigan, Pyke Johnson and N. C. Damon of the National Automobile Chamber of Commerce and M. L. Heminway and Herman Deuster of the Motor and Accessory Manufacturers Association.

In the main, however, little progress was made in arriving at a definite understanding, and the automobile representatives left with the intention of preparing a brief to be filed with the Federal tax officials, which will set forth in writing the points raised during the verbal discussion today, in order to get a clearer ruling on some phases of the automotive section of the new tax law.

Parts for Non-Automotive Use

Points brought out in the discussion had to do with parts and accessories sold for non-automotive purposes, which apparently are taxable under the bureau's interpretations, together with the question of when an automobile body really is an automobile body, etc.

Another phase from which complications are expected to arise is the effectiveness of the new law. It was passed June 2, the law specifying that it became operative in 30 days. The new tax regulations were signed Aug. 29 and stipulated that they were to become effective Sept. 15.

The regulations were not printed until the latter date, and millions of dollars' worth of automotive equipment have been sold, which, under the interpretations, are taxable. The manufacturer, not knowing of the interpretation, has sold his product without collecting the proper tax called for in the regulation's interpretation. The customer, it was pointed out, will not pay the taxes now. Will the manufacturers have to stand this loss? is asked.

More Taxes Broadcast

"We left the bureau with the feeling that, while Congress tried to cut off a little of our taxes, under the new law and rulings more taxes have been broadcast, like wild oats, among the engine, battery and parts makers—taxes which heretofore were exempt under the old law," said Mr. Brannigan.

"However, there is no feeling on our part that this is the fault of the officials of the Internal Revenue Bureau. They have interpreted the law as they believe it to be written, and are not the makers of the new tax bill."

Men of the Industry and What They Are Doing

Cord Is Auburn General Manager

E. L. Cord has been elected vice-president and general manager of the Auburn Automobile Co. The appointment will not disturb the personnel of the organization and comes on the first anniversary of J. I. Farley's service as president of the company. In making the announcement of Mr. Cord's election, Mr. Farley states that the company is in excellent shape, all outstanding obligations, including indebtedness to banks, have been paid and a substantial amount of preferred stock retired two years in advance of requirements.

Eaton Axle Personnel Changed

Several changes in the personnel of the Eaton Axle & Spring Co. are announced. C. I. Ochs, vice-president and general manager of the axle division, has been appointed general manager of the entire company, embodying the bumper, spring and axle divisions, with plants at Cleveland, Pontiac and Albany.

C. A. Bieber has been made general manager of the Eaton Axle & Spring Service Co., in charge of the five factory branches as well as of the jobbing department of the parent company. W. J. Keegan has been chosen assistant general manager of this division.

E. J. Cosgrave has been named sales manager of the bumper division and transferred to Detroit from New York, where he has been branch manager. The New York vacancy has been filled by the appointment of W. R. Roestel, formerly Cleveland branch manager of the Eaton company.

Farley Returns Home

J. I. Farley, president of the Auburn Automobile Co., has returned from a month's stay in Europe, visiting Auburn distributors and dealers. Mr. Farley believes the outlook for American cars is good in Holland, Belgium and Germany.

Lon R. Smith With Zenite

Lon R. Smith of Indianapolis has been appointed manager of the windshield division of the Zenite Metal Co., which also manufactures alite metal moldings, lead-filled moldings, taxicab lamps, finishing tips for nickel and silver, metal stampings and foot rails. Mr. Smith formerly was western representative of the Eise-mann Magneto Co., sales manager of the Buda Co., and vice-president in charge of sales and advertising of the Mid-West Engine Co.

R. K. Mitchell Joins Marmon

Robert K. Mitchell has joined the Nor-dyke & Marmon Co. as production super-intendent. Mr. Mitchell for nine years was identified with the Maxwell Motors Corp., resigning as director of planning of the Maxwell-Chrysler organization to

go to Indianapolis. Following the addition of Mr. Mitchell to the Marmon staff of executives, President G. M. Williams announced that the plant will be rearranged to care for the expected increase of 50 per cent in construction, and that the new program will involve the outlay of \$9,500,000 for materials and labor alone.

L. M. Stellman with Skinner

L. M. Stellman has resigned as chief engineer of the H. H. Franklin Manufacturing Co. to become consulting engineer of the Skinner Automotive Device Co., Inc., of Detroit, maker of the Skinner oil rectifier. Mr. Stellman was associated with the Franklin company for 15 years, having joined the engineering department upon his graduation from the University of Michigan.

LeFevre Heads Westinghouse Branch

C. D. LeFevre has been placed in charge of a new automotive air brake sales and service branch which the Westinghouse Air Brake Co. has opened in the General Motors building, Detroit. Mr. LeFevre has served for several years as assistant secretary of the Society of Automotive Engineers and at one time was special factory representative of the Westinghouse Union Battery Co.

Promotion for J. W. Hobbs

John W. Hobbs, manager of the Moline branch of the Borg & Beck Co. and consulting engineer of the Chicago plant, has been advanced to general manager of the Boston and Quebec plants of A. O. Norton, Inc., purchased by Borg & Beck recently. Mr. Hobbs has been in Moline three years, since his association with the Borg & Beck interests. He went to the Rock Island Arsenal in 1917 as a motor vehicle test supervisor.

General Electric Makes Appointments

B. C. Bowe has been appointed manager of Tungar sales by the General Electric Co. and the section has been moved to Bridgeport. C. E. Hamann, K. W. Nelson and E. N. Sampson accompany Mr. Bowe to Bridgeport. The company also has appointed W. M. Miller in charge of mercury arc rectifier sales, with headquarters at Schenectady. F. M. Kimball, with headquarters at Lynn, has been given charge of motor generator battery charging equipment for vehicles, and J. H. Clough, located at Schenectady, will have charge of special laboratory product sales.

Jackson Sails for Europe

A. T. Jackson, vice-president in charge of sales of the Emerson-Brantingham Co., Rockford, Ill., has sailed for Europe, to be gone six weeks in the interest of the company's foreign sales.

Owen to Survey Field Abroad

Percy Owen, chief of the Automotive Division of the Department of Commerce, will sail for Europe this week to make a six weeks' or two months' survey of automotive conditions and to appear as official representative of the Government at the organization meeting in Paris of the Central Council of International Tour-ists Organization. He will attend both the Paris and London shows and will visit Italy, Germany and the Scandinavian countries.

Russell Heads Canadian Chamber

T. A. Russell, president of Willys-Overland, Ltd., and C. H. Carlisle, vice-president and general manager of the Goodyear Tire & Rubber Co. of Canada, Ltd., have been elected president and vice-president, respectively of the Automotive Industries of Canada. R. H. Mulch, general manager of Durant Motors of Canada, Ltd., has been elected to the board of directors.

Slauson Is Consulting Engineer

H. W. Slauson has resigned as engineering service manager of the Kelly-Springfield Tire Co. and has opened an office in the Fisk Building, New York City, as a consulting automotive engineer, serving in an advisory capacity for the merchandising and advertising of automotive products. Mr. Slauson will continue to carry on a portion of his work with the Kelly-Springfield company.

Brashear Is Assistant Sales Manager

Rex Brashear, lately factory service manager, has been appointed assistant sales manager of the Moon Motor Car Co., succeeding Neil E. McDarby, who recently left the Moon company to become associated with the Embleton Motor Co., Moon distributor in San Antonio, Texas.

Baker to Visit Continental Shows

J. A. Baker, chief engineer of the Willys-Overland Co., will sail about Oct. 1 for Europe, where he will attend two or three continental shows, including Paris and Budapest, and then will visit the plant of Willys-Overland-Crossley, Ltd., near Manchester, England.

Kerr to See Foreign Shows

George W. Kerr, body engineer of the Reo Motor Car Co., has sailed for Europe and will visit both the Paris and London shows while on his trip abroad.

Bowman Opens Offices

Joseph C. Bowman, specializing in industrial advertising, has opened permanent headquarters in the Penton Building, Cleveland.

G.M.C. Closed Cars Increase in Number

Average 40 Per Cent of Output
This Year Compared with
37 Per Cent in 1923

NEW YORK, Sept. 22—Predicting that "the time is fast approaching when the term 'automobile' will mean a motor car with a closed body—not an open touring car," the General Motors Corp. announces that its closed car production so far this year by its various divisions has averaged 40 per cent, in comparison with 37 in 1923 and 28 in 1922. At the present time this production is averaging 41 per cent and is practically the same as in January.

As reported by General Motors, the closed car percentage by months is as follows:

	1924	1923	1922
January	42%	34%	29%
February	38%	35%	29%
March	38%	36%	25%
April	42%	40%	22%
May	41%	38%	19%
June	37%	35%	26%
July	37%	31%	26%
August	42%	30%	31%
September	41%	35%	37%
October	38%	24%	
November	42%	30%	
December	44%	39%	
Yearly average.	40%	37%	28%

\$Estimated

*Nine months January through September, 1924.

Pointing out that the industry as a whole also is running strong on closed cars, it quotes figures for the last six years, showing 7 per cent in 1918, 10 per cent in 1919, 17 per cent in 1920, 22 per cent in 1921, 30 per cent in 1922 and 35 per cent in 1923 for all motor vehicle manufacturers.

"The tendency of buying in motor cars is toward the closed car and each year the percentage of closed cars to the total number sold is increasing," comments General Motors. "With the coming of the fall and winter months it is to be expected there will be the usual slight seasonal increase in the demand for closed cars. The facts are that the number of closed cars sold, compared with the total number sold, shows a percentage which is fairly steady the year round—a surprise to most people."

August Sales Declined in Metropolitan Area

NEW YORK, Sept. 24—Total sales of all types of new cars in the metropolitan district for the first eight months of the year are greater than for the corresponding period of last year, despite a falling off in August and a smaller total of high priced cars for the eight months.

The monthly sales analysis of Sherlock & Arnold shows 67,513 cars in the low and medium priced field sold in the eight

months of this year, as against 61,182 in the corresponding period of last year and 49,431 in the eight months of 1922. In the high priced field sales so far this year aggregate 4857, compared with 5995 last year and 5070 in 1922.

The sales in 1923 and 1924 are divided as follows:

LOW AND MEDIUM PRICED FIELD		
	1924	1923
January	3,548	2,803
February	3,814	2,775
March	8,179	8,050
April	12,133	11,050
May	11,597	11,220
June	8,958	9,399
July	11,376	9,127
August	7,870	6,458

Total 67,513 61,182

HIGH PRICED FIELD		
	1924	1923
January	292	212
February	357	606
March	674	821
April	972	1,180
May	808	1,059
June	609	815
July	667	760
August	478	542

Total 4,857 5,995

In the low and medium priced field five makes show sales for the eight months of this year in excess of 5000 and three others greater than 2000. Two makes in the higher priced field report sales surpassing 1200.

More Speakers Announced for M. A. M. A. Convention

NEW YORK, Sept. 22—Acceptances have been received from more of the men prominent in the industry who have been asked to speak at the fall convention of the Motor and Accessory Manufacturers' Association, to be held at Cleveland, Oct. 15-17.

It has been arranged for the Cleveland City Manager to deliver the address of welcome at the opening session, while "General Outlook" in the discussion on "The Outlook for Better Business" at the same session will be handled by Richard F. Grant, president of the Chamber of Commerce of the United States, with Alfred Reeves, W. O. Rutherford and G. Brewer Griffin presenting the automotive point of view.

At the afternoon session of the second day, L. A. Safford, vice-president of the McQuay-Norris Manufacturing Co., has been booked for "Getting and Holding the Interest of the Jobber Salesman." At the same session Neal G. Adair has been scheduled to talk on "The M. A. M. A. Show Program As a Merchandising Medium."

H. L. Kraus, export sales agent, has accepted the assignment "Selling the Foreign Trade—Through an Export Sales Agent."

On the third day, morning session, Ludwig Kemper, treasurer of the Midland Steel Products Co., will talk on "Facing the Facts," while "Handling Foreign Credits" has been assigned to J. L. Thompson, credit manager of the Yale & Towne Manufacturing Co.

Freight Car Supply Held to Be Adequate

No Shortage Expected, Although
Rail Activities Are on the
Increase

DETROIT, Sept. 22—The question of automobile car supply received considerable attention at the conferences of freight traffic managers of the industry, held here last week under the auspices of the National Automobile Chamber of Commerce, with James S. Marvin, the chamber's traffic manager, as chairman.

Specific Ratings Discussed

The situation, however, is not alarming, despite the increased activities of the railroads, and a shortage of freight cars is not expected.

"It develops that with the railroads again handling more than a million cars of revenue freight weekly," Mr. Marvin said, "car supply for the increasing production of the automobile plants is not as plentiful, although no actual shortages are as yet reported. The feeling is that for the time being, at least, no trouble will be encountered in transferring factory production to dealers."

Reports to the meeting indicated that railroads are planning to revise class rates applying in Central freight and Eastern truck line territories and between those districts. Tentative schedules indicate considerable increase in the rates that would apply on the higher classes, which include automobiles, trucks and automobile parts.

In the all-day session specific ratings applying on lamps, carpets, steering wheels, buses and many other automobile parts were discussed in detail. It is expected that changes in the classification of some of these parts will be asked of the railroads.

George F. Bauer, secretary of the N. A. C. C. Foreign Trade Committee, it was announced, is now conferring with Mexican National Railway officials in Mexico City on the question of minimum carload weights charged on automobiles in Mexico, which is more than double the minimum assessed by American railroads.

August Sales in Michigan Increased Over Year Ago

DETROIT, Sept. 23—August new car sales in the State of Michigan totaled 12,462, an increase over August last year which totaled 11,638, but a decrease under July, this year, when sales were 19,173. The increase for the entire State was in the face of a loss in Detroit, where sales were almost 1,000 under August of last year. Truck sales for the State approximated those of last August, the loss being mostly in light vehicles.

The Ford percentage of August business was 47, one per cent under last August. All low-priced lines made up 63.5 per cent of the month's business.

Underwriters Oppose Compulsory Policies

Contend That State Laws Would
Tend to Make the Pedestrian
Careless

MILWAUKEE, Sept. 22—Strong opposition to compulsory automobile insurance was voiced in a discussion of the subject at the annual convention of the National Association of Insurance Agents, held here during the past week. The fact that 16 States have legislation under consideration looking to this radical development precipitated the topic as one of the most important subjects before the convention. No defense of compulsory insurance was found in any quarter.

In the arguments advanced it was declared that there were 17,000 traffic deaths last year in this country, an average of one to every 800 automobiles. This percentage is so small that it was held no one can justify laying on the 799 automobile operators the burden of guaranteeing the payment to the person who is injured by the one remaining out of the 800. It is not sound, they said.

Will Not Stop Recklessness

It was contended that compulsory insurance will not make the reckless driver less reckless and it was asked if the pedestrian's instinct of self preservation would be improved or strengthened if, instead of knowing that he himself must assume and must pay the expense incident to his injury, he is assured in advance that somebody else is going to pay.

The meeting declared for the individual licensing of the driver. It also felt that it is not common sense to load on the careful, considerate operator the burden of guaranteeing the collection of minor property damage claims.

Compulsory insurance, it was declared, had been one of the ideas suggested in the various safety campaigns as a method of reducing the number of accidents. This statement produced the following comment:

Public Will Not Be Satisfied

At first sight it (compulsory insurance) looks like a fine scheme. Somebody is hurt in an automobile accident—oh, well, insurance will pay for the injury. But will the public mind be contented then? Will not the public still demand the hazard causing the accident to be removed? Will compulsory insurance reduce the number of accidents, check reckless driving or make drivers more careful? It will do nothing of the kind.

If the reckless or indifferent driver who today is without insurance and is mowing down the unfortunate pedestrian in his path has insurance protection to cover his acts, he would be a greater source of danger and would take more risk. It also is a reasonable supposition that compulsory insurance would increase carelessness on the part of the pedestrian and thus increase the danger of accidents.

The fact that 16 States have studied the

plan and not one has adopted it seems to establish that it is an unsound principle. A lien law might cover the situation. When a driver, involved in an accident for which he is liable, fails to satisfy a claim or judgment the car should be a first lien to satisfy such claim or judgment; which lien shall be superior to any mortgage or such car or to any interest in the automobile, whether by conditional sales agreement where the car is bought on time, or otherwise.

This would cause the mortgagee or dealer selling the car to compel the purchaser to procure liability insurance at the time of purchase, just as he now does in the matter of fire and theft insurance.

Graham Presents Views

WHITE SULPHUR SPRINGS, W. VA., Sept. 23—George M. Graham, chairman of the traffic planning and safety committee of the National Automobile Chamber of Commerce, represented the

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S. A. E. Founder Member, G. E. Franquist, Is Dead

PHILADELPHIA, Sept. 22—Gustave E. Franquist of Rochester, N. Y., a pioneer in the automotive industry, died here in the Presbyterian Hospital following a short illness.

Mr. Franquist was one of the founder members of the Society of Automotive Engineers and was 50 years old at the time of his death. He first entered the industry in 1900 with the Buffalo Spring & Gear Co., which was building a carriage propelled by a one-cylinder two-cycle engine. In 1902 he became superintendent and engineer for Smith & Mabley, then importing Mercedes and Panhard cars. In 1903 Mr. Franquist designed for Smith & Mabley the Simplex, which at that time was one of the best known of American cars.

When Smith & Mabley, in 1903, took up the manufacture of gasoline driven motor boats, Mr. Franquist designed the engines and supervised the building of both hulls and engines, turning out such well known speed boats as Vingt-Et-Un, Challenger, Dixie I, Dixie II and Dixie III.

From 1918 to 1923 Mr. Franquist was chief engineer of the James Cunningham & Sons Co. of Rochester.

Head of Republic Rubber, Edward H. Fitch, Jr., Dies

NEW YORK, Sept. 22—Edward Hubbard Fitch, Jr., president of the Republic Rubber Co. of Youngstown, Ohio, a subsidiary of the Lee Rubber & Tire Corp., died in Hudson, Ohio, Saturday after a long illness. For a considerable time Mr. Fitch had been inactive in the company because of his ill health.

Mr. Hatch had been identified with the tire industry since 1903, when he joined the staff of the Diamond Rubber Co. Soon he became Philadelphia branch manager, and when the B. F. Goodrich Co. absorbed the Diamond he was appointed director of sales of the Diamond division, a position which he held until July, 1922, when he became president of the Republic company.

N. A. C. C. Lays Plans for October Meeting

Show-Space Will Be Drawn and
Export Managers and Truck
Makers Will Meet

NEW YORK, Sept. 24—Drawing for show-space, an export managers' convention, a meeting of the truck manufacturers and a general meeting of all members are a few of the activities of the National Automobile Chamber of Commerce next week, marking the beginning of the winter season.

The national shows are, of course, the reason that the October meeting is always an important one and this year it is expected that greater interest than ever will be evinced because of the programs arranged for these big exhibitions which open 1925. The lists close next Saturday and it is thought that there will be as many applications for space as last year. There may be a slight falling off in the number of car exhibitors, caused by the passing of several during the past year, but what is lost here will be more than made up by the manufacturers of parts and accessories.

Show Drawing Thursday

The week will open on Wednesday with the usual monthly meeting of the directors, with the general meeting of N. A. C. C. members on Thursday morning. At its conclusion the drawing for show space will take place.

Truck manufacturers holding N. A. C. C. membership will meet that same afternoon, and while the program has not been announced as yet, it is expected that Thomas P. Henry, president of the American Automobile Association, will speak on the proposed division of the A. A. A., which will be open to truck and bus operators and in which the chamber is cooperating in organizing.

John N. Willys, chairman of the foreign trade committee of the N. A. C. C., will preside at the export managers' convention, which will be held on Friday, Oct. 3. Some of the addresses and topics suggested for the meeting are as follows:

List of Possible Subjects

"The Automotive Situation in Europe," by Alfred Reeves, General Manager of the N. A. C. C., recently returned from a tour of the principal European countries.

"Can the American Automotive Finance Company Extend Facilities Abroad and What Help from Manufacturers is Necessary to do so?"

"What is a Proper Policy on Balloon Tire Equipment for Export?"

"Can Boxing of Export Automobiles Be Eliminated with Saving to Purchaser?"

"Different Angles of the Mexican Automotive Market," by George F. Bauer, secretary of the N. A. C. C. Foreign Trade Committee and automotive representative of the American Industrial Mission to Mexico.

"Should Truck Manufacturers Advertise Definite Prices to Facilitate Export?"

G. M. C. Capital Plan Is Put Into Effect

Old Shares of Common Stock Can Now Be Exchanged for Four of New Issue

NEW YORK, Sept. 22—The plan for simplification of the capitalization of General Motors, which was approved by stockholders on June 18 has become effective, and common stockholders have the right to exchange their present no par value common for the new issue of common (no par value capitalized at \$50 a share). New common will be issued on the basis of one share for each four shares of old common. No further dividends will be declared on the old.

The new issue has been listed and will be quoted on the New York Stock Exchange, and in due course the old stock will be stricken from the list. No more certificates of the old common will be issued.

G. M. C. Dividend Policy

As to the dividend policy on the new common, a statement issued by General Motors says:

While the officers of the corporation cannot forecast or make commitment with respect to common stock dividends, it would seem quite in order at a time when such substantial changes are being made in capitalization to advise stockholders that with the same general conditions existing which would support a dividend policy of \$1.20 per share per annum on the old common stock (equivalent to \$4.80 on four old shares exchanged for one new share) a dividend policy of \$5 per share per annum on the new common stock would be substantially the same and therefore equally conservative.

Dividends declared will be paid on the same dates as present dividend payments, namely, the twelfth days of March, June, September and December. And the individual feeling of the members of the Finance Committee is to recommend to the directors the declaration of an initial dividend of \$1.25 a share, payable on the new common stock Dec. 12 next.

Radiator Cap Litigation Ended Through Settlement

CHICAGO, Sept. 22—Settlement of the legal differences between Miller & Pardee, Inc., and the Advance Products Corp., et al, involving radiator cap rights, has been effected, following the withdrawal of an appeal from the decision of Judge Wilkerson in the United States District Court, who upheld the patents covering the Monogram radiator cap, owned by Miller & Pardee, Inc.

According to counsel for the complainants, this settlement has resulted in the Keystone interests paying \$25,000 cash and agreeing to deliver immediately to the Monogram manufacturers all of the Keystone and Stalock caps, all tickets and advertising matter and all jigs and dies used in their manufacture. It also is stated by the Monogram lawyers that

the settlement does not release concerns that have resold the infringing caps, specifying particularly the jobbers.

Keystone attorneys have confirmed the settlement, stating that their clients will suspend production and shipment of the caps which have been involved in the litigation.

FINANCIAL NOTES

Fisk Rubber Co., for the nine-month period ended July 31, reports a net profit after interest—including bond interest—and other charges of \$1,710,000. Net sales totaled \$37,000,000, with operating profit after depreciation but before interest and other charges, of \$2,585,000. The company estimates that the sales and net profits for the last quarter of its fiscal year will equal if not exceed that of the third quarter, which shows net sales of \$14,000,000, with operating profits after depreciation but before interest and other charges, of \$1,145,000, and after interest—including bond interest—and other charges of \$835,000.

Eaton Axle & Spring Co. has issued a statement as of July 31 showing total assets of \$8,826,340 compared with \$8,637,377 on Dec. 31, 1923. Current assets totaled \$3,104,486 and current liabilities \$1,072,036 against \$3,015,571 and \$776,763 respectively in 1923.

Goodyear Tire & Rubber Co. announces through Dillon, Read & Co. that \$750,000 of the principal amount of first mortgage 20-year 8 per cent sinking fund gold bonds have been called, by lot, for redemption.

Goodyear Tire & Rubber Co. of Canada has declared a dividend of 1½ per cent on account of accumulation on preferred and regular quarterly of 1¼ per cent, both payable Oct. 1 to stock of record Sept. 20.

Electric Auto-Lite Co., Toledo, has declared the regular quarterly dividend of \$1.50 on the common, payable Oct. 1 to stock of record Sept. 16.

F. B. Stearns Co. has declared the regular quarterly dividend of 50 cents a share, payable Oct. 20 to stock of record Sept. 20.

Association Executives Meet Federal Officials

WASHINGTON, Sept. 23—Preliminary steps toward securing a definite expression from the Federal Government as to its attitude toward trade associations were taken this week when representatives of the Chamber of Commerce of the United States, the National Automobile Chamber of Commerce and other representative bodies conferred with Federal authorities. Another meeting will be held in November.

The committee, headed by Alfred Reeves, general manager of the N. A. C. C., and Richard F. Grant, president of the United States Chamber of Commerce, met with Attorney General Stone, Secretary Hoover and the Federal Trade Committee.

MOTORCYCLE PRICE REDUCED

CLEVELAND, Sept. 23—With the introduction of the 1925 models of Cleveland Motorcycles, a reduction in price from \$200 to \$185 and a number of mechanical improvements have been announced.

Cut of \$60 Affects Dodge Special Types

Economies in the Purchase of Equipment Assigned as Reason for Reduction

DETROIT, Sept. 20—Price reductions of \$60 have been made by Dodge Brothers on the four special type cars included in its line, the reduction being made possible, the company states, by economies effected in the purchase of equipment used exclusively on the special type cars.

The new prices are special phaeton, \$995; special roadster, \$965; special A sedan, \$1,485; special B sedan, \$1,350; special business coupe, \$1,135, and special four-passenger coupe, \$1,475. Prices on the standard types are unchanged.

Commenting on the decreased prices, the company says:

Dodge Brothers special types consist of the standard cars equipped with accessories which produce the utmost in comfort and convenience and appearance of the car. Among these are steel disk wheels, five balloon tires, nickel-trimmed radiator, nickel-plated bumpers, automatic windshield wiper, rear view mirror, scuff plates, cowl lights and Moto-Meter with lock. A special body stripe is also provided.

Manufacturing and buying these accessories in quantity, Dodge Brothers are naturally able to install them at prices considerably below what the owner would have to pay at retail. The public was quick to sense this and the demand for the special types grew steadily from the moment they were available.

New Overland at Show, Also 2 Willys-Knights

NEW YORK, Sept. 24—The Overland all-steel sedan and the Willys-Knight brougham and business coupe will be exhibited for the first time at the New York closed car show, which opens Saturday. The sedan model is finished in blue with black enameled radiator, hood, fenders and splashers.

The brougham is finished in a two-tone color combination of dust-proof gray and beaver brown, with black moldings and top. The upholstery is velvet. Equipment on this model includes rear view mirror, domelight, automatic windshield cleaner, sun visor, hood ledge aluminum molding and heater. The list price is \$1,885.

The business coupe differs in body color, upholstery and interior fittings from the coupe de luxe model announced last spring. The new body model is finished in blue lacquer with black molding lines. The top also is black with japanned landau joints. The price of this model is \$1,495.

All Overland models now are equipped with the Stewart vacuum fuel feed system, the gasoline tank now being located at the rear of the chassis instead of under the cowl.

INDUSTRIAL NOTES

Central Gear & Manufacturing Co., Indianapolis, organized and operated for some time as the Automatic Gear Blank Co., is putting in a large amount of gear cutting equipment in accordance with its expansion plans. It is still doing an extensive business in automatic screw machine products work along with the cutting of spur, helical and worm gears. The company is being operated by the following officers: C. William Whaley, chairman of the board; Charles Drexler, president; Charles Retherford, vice-president and salesmanager, and W. Carleton Starkey, secretary and treasurer.

Dalton Manufacturing Corp., with main office and factory at Sound Beach, Conn., maker of small lathes and the Dalton combination machine tool, has retired from business, being succeeded by the Dalton Tool Corp. The latter is made up of old employees of the Dalton Manufacturing Corp. and is managed by them, with a factory located at Willow Avenue and 133d Street, New York City.

Roller-Smith Co., maker of electrical instruments and circuit breakers, New York City, announces the appointment of the Thrall Electric Co., Havana, as its exclusive representative for Cuba. The Thrall Electric Co. is the successor of the Charles H. Thrall Electric Contracting Co., which in turn was the successor of Charles H. Thrall & Co., organized in 1899.

Gladiator Manufacturing Co. has taken over the rights to manufacture and sell the Noble heater, heretofore made by the Noble Heater Co. of Fort Wayne, Ind. It plans increased production, with a consequent lowering of prices.

Underwriters Opposing Compulsory Insurance

(Continued from page 585)

automobile industry at the convention of the International Association of Casualty and Surety Underwriters here today.

In his address he went into detail on the safety work being done by various organizations and winding up by outlining to the underwriters the industry's views on compulsory insurance.

"The automobile industry has not up to this time been able to convince itself of the equity or the efficiency of compulsory insurance as a safeguard to traffic," Mr. Graham declared at the end of his speech. He prefaced this statement as follows:

Of late there has been an increasing tendency to suggest compulsory liability insurance as a panacea. This demand calls for provision by law so that in case of accident there may be available adequate compensation for the sufferer.

Whether such a plan would work out is a question. It does seem fundamentally unfair that the victim of an accident should have no power of recovery because the offending driver has no assets. But any attempt to correct this injustice by making compulsory liability insurance a prerequisite to the issuance of a license might lead to worse injustice.

It is doubtful whether such a law would reduce automobile accidents. Careless driv-

ers might shelter under the protection of this insurance, and be still more reckless.

It would undoubtedly be a step toward socialism and would provide new obstacles against the enjoyment, convenience and profit of individual transportation. It would increase the cost of motoring to many worthy persons who are now careful drivers. In fact, the additional cost would deprive many of the ability to own an automobile.

Particularly would this work injustice against the farmer. Actually, there is little need of protecting the public against the farmer driver, for he is in most cases a very careful motorist.

As he sees it, there are eleven ways by which the daily toll of traffic accidents can be stopped. They are:

1. Accurate statistics, frequently presented.
2. Community education, through various kinds of publicity.
3. Education of the child.
4. Education of the adult pedestrian.
5. Educating the driver.
6. Developing standardized signals.
7. Adequate protection of grade crossings.
8. City planning for future needs.
9. Highway designing, such as banking of curves.
10. Cooperative organizations, stimulating and supporting official efforts.
11. Vigorous punishment for traffic offenders.

Bosch and Gray & Davis Agree on Merger Terms

SPRINGFIELD, MASS., Sept. 23—Directors of the American Bosch Magneto Co. and Gray & Davis, Inc., have come to an agreement as to the terms for merging the two concerns. Arthur T. Murray, president of the Bosch company, said today that the proposition will be submitted to the Gray & Davis stockholders Oct. 14 and to American Bosch stockholders Oct. 16.

Mr. Murray says that, while the proposed terms cannot be made public yet, the exchange of stock will be as nearly as possible on the ratio of earnings of the two companies as based on actual capital values. Under the merger plans, Mr. Murray says, operations will center very largely at the Springfield plant, but the Cambridge factory will not be discontinued entirely. Beginning Oct. 1, he said, decided increases of production are on the program.

Chrysler Sales Totaled \$18,225,469 in 7 Months

DETROIT, Sept. 23—Figures given out by Walter P. Chrysler, president and chairman of the Maxwell Motor Corp., show that for the first seven months of 1924 factory sales of Chrysler and Maxwell cars totaled \$42,381,859, as compared with the company's total sales of \$35,311,966 for the same period last year.

Of this total Chrysler sales amounted to \$18,225,469 and Maxwell's to \$24,146,390. Chrysler sales now, Mr. Chrysler says, are running ahead of Maxwell, showing a monthly volume of approximately \$4,500,000. The first weeks of September showed larger sales than in July.

METAL MARKETS

Some automotive steel buyers are actually disappointed because of the promptness with which mills are making shipments. This is especially true of sheets. Some purchasing agents who placed orders somewhat more in advance than they had been accustomed to of late, expected that developments would justify their foresight and that their less sagacious colleagues would be obliged by this time to send out S.O.S. calls for shipments. In the matter of price those who ordered a little ahead of others lost nothing.

Steel producers have now completely adapted themselves to the new method of buying. They recognize that the hand-to-mouth buying which brought about the change calls for greater flexibility in the rate of operations and have adjusted their production methods to fit in with it. The old time method of contracting and later, much later, specifying against these contracts has passed out. Its passing is not at all regretted by producers who in the old days might have a splendid backlog of contracts but no specifications to keep their mills running, and, if the market suffered a sharp setback, these contracts were largely "scraps of paper."

For this very reason, so frequently lost sight of, much greater stability in price movements is noted. Frequently when old-time steel buyers say these days: "I haven't much faith in the market," they are merely using a phrase of the old days, which no longer has much meaning. They buy steel only when they need it, and it doesn't make very much difference, when a man needs steel, whether he has faith in the market or not. He must have it. In the days of contracts unaccompanied by specifications, faith in the market or lack of faith in it decreed to a large extent the volume of these contracts, then perhaps the greatest factor in price making. Today steel orders represent actual demand. When they are heavy, prices harden; when they are light, prices sag. "Faith in the market" has become an obsolete sentiment when steel is bought today and consumed within a fortnight. Cold-finished steel bar makers are reported to have shaded prices on attractive tonnages and specifications. The hot-rolled raw material is also very easy. Full-finished automobile sheets rule firm at unchanged quotations.

Pig Iron.—Quiet prevails in the market for foundry and malleable irons, but producers are not pressing iron for sale at the sacrifice of price. The rising tendency in the scrap market is a strengthening factor in the pig iron situation. Automotive foundries are buying in a routine way.

Aluminum.—Market conditions show no new developments and the market's future is entirely wrapped up in the prospective demand from passenger motor car builders. Odds and ends of Continental metal and routine shipments of Norwegian aluminum continue to arrive. The secondary and remelted market is rather firm.

Copper.—The slight setback in the upward movement of copper prices induced considerable buying from domestic consumers. Connecticut Valley fabricators have a fair quota of orders for automotive brass parts. Copper wire was quoted slightly lower by some producers as the result of the decline in the metal.

Lead.—Demand is seasonably more quiet with prices easy to steady.

Calendar

SHOWS

- Oct. 21-27—Transportation Show, Motor Truck Industries, Inc., American Exposition Palace, Chicago.
- Nov. 9-15—New York, Annual Automobile Salon, Commodore Hotel.
- Nov. 10-15—Chicago, Annual Show and Convention of the Automotive Equipment Association, Coliseum.
- Jan. 2-10—New York, National Automobile Show, under the auspices of the National Automobile Chamber of Commerce, Bronx Armory. Open to the public except on Jan. 2 and 3 which are trade days.
- Jan. 23-31—Chicago, National Automobile Show, under the auspices of the National Automobile Chamber of Commerce, Coliseum and First Regiment Armory. Open to the public except on Jan. 23 and 24 which are trade days.
- Jan. 25-31—Chicago, Annual Automobile Salon.

FOREIGN SHOWS

- Oct. 2-5—Dantzic, Second International Dantzic Fair, automobiles and allied equipment.
- Oct. 2-12—Paris, passenger cars, motor cycles, bicycles and accessories, Grand Palais.
- Oct. 17-25—London, Annual Passenger Car Show, Olympia.
- Oct. 22-31—Paris, motor trucks, stationary engines, garage tools and machine tools, Grand Palais.
- Nov. 9-19—Buenos Aires, Annual Automobile Show, Pabellon de las Rosas, under the auspices of the Automovil Club Argentino.
- Dec. 1-13—Montevideo, Uruguay—Second Annual Motor Show, under the auspices of the Centro Automovilista del Uruguay, held in buildings of the Asociacion Rural del Uruguay.

RACES

- Oct. 2-4—Dayton, Ohio, Fifth Airplane Race for the Pulitzer Trophy.

- Oct. 4—Fresno.
- Oct. 19—Kansas City.
- Nov. 24—Los Angeles.

CONVENTIONS

- Oct. 15-17—Cleveland, Fall Convention of the Motor and Accessory Manufacturers Association.
- Oct. 16-18—Briarcliff Manor, N. Y., Semi-Annual Meeting of the American Gear Manufacturers Association, Briarcliff Lodge.
- Jan. 5—New York, Convention under the auspices of the National Automobile Dealers Association, Hotel Commodore.
- Jan. 26-29—Chicago, Eighth Annual Convention of the National Automobile Dealers Association, Hotel LaSalle.

S. A. E. MEETINGS

- Oct. 2—Aeronautical Meeting at Dayton at the time of the Pulitzer Races.

- Oct. 2—Indiana Section, Relation of the Motor Transport Corps of the U. S. Army to the Automobile Industry, A. W. Harrington, chief of the Engineering Division of the Motor Transport Corps; November Meeting, Talk by H. A. Huebotter of the Engineering Experiment Station of Purdue University; Dec. 11—Aviation Development, Major E. L. Hoffman; Superchargers, Dr. F. A. Moss; Jan. 15—Lubrication and Crank Case Dilution, S. W. Sparrow of the U. S. Bureau of Standards; Mid-February Meeting, Automobile Finishes; March Meeting, Developments in Transmission; April 9—Talk by F. E. Hunt, vice-president of the General Motors Research Corp.
- Oct. 22-24—S. A. E. Production Meeting, Detroit.
- Nov. 18-19—Joint Service Meeting of the S. A. E. with the N. A. C. C. Cleveland.
- Jan. 20-23—S. A. E. Annual Meeting, Detroit.

Indiana Engineers Arrange 7 Meetings

INDIANAPOLIS, Sept. 24—The Indiana Section of the Society of Automotive Engineers has announced its fall and winter program, beginning Oct. 2, when A. W. Harrington, chief of the engineering division of the Motor Transport Corps of the United States Army, will speak on the "Relation of the Motor Transport Corps to the Automobile Industry." Mr. Harrington will also tell of the close work of the division with the Bureau of Standards and other research bodies of the government.

Each of the fall and winter meetings will be held in connection with monthly dinners of the section. At the November meeting, H. A. Huebotter, of the engineering experiment station of Purdue University, will give the principal talk. Dec. 11, Maj. E. L. Hoffman, of Grisard Field, Cincinnati, will present a paper on Aviation Development, while Dr. F. A. Moss will discuss superchargers.

Next Year's Meetings

S. W. Sparrow, of the Bureau of Standards, will speak Jan. 15 on Lubrication and Crank-Case Dilution, while the mid-February meeting will be devoted to a discussion of Automobile Finishes. During March, a meeting will be held on Developments in Transmission, with the speaker to be announced later. J. E. Hunt, vice-president of the General Motors Research Corp., at Dayton, will address the last meeting to be held April 9. His subject will be announced later.

The Meetings and Papers Committee of which F. Hall Marmon, of the Engineering Department of Nordsyke & Marmon, is chairman, and with its members drawn from the governing board, has held many sessions during the summer, and the advanced plans and four-page

printed schedule sent to section members this week is the result. The section is making an effort to attract engineers from other lines, particularly the highway people, to the meetings this year and has started propaganda to this end. Non-member automotive men of the State have been invited to meetings.

Hupp Dates Show Events to Meet Trade Day Plan

NEW YORK, Sept. 23—Enthusiasm over the trade days at the national shows continues to grow, Neal G. Adair, show manager of the Motor and Accessory Manufacturers' Association, being informed by O. C. Hutchinson, general sales manager of the Hupp Motor Car Co., that his concern has moved forward its luncheons and dinners in order to take advantage of the innovation.

The luncheon to dealers in the New York territory will be held Monday noon, Jan. 5, at New York, and the dealers' dinner at the Chicago show will be held on Tuesday night.

Mr. Hutchinson also states that it is planned to have the sales executives as well as the officers of the manufacturing and purchasing departments present at the trade days.

The M. A. M. A. also has made a survey of the motor fleet owners and service station managers and has received scores of letters from them commending the trade days and promising attendance by their organizations.

69,427 G. M. STOCKHOLDERS

NEW YORK, Sept. 22—General Motors Corp. has mailed dividend checks to 47,746 common stockholders of record Aug. 25. The total number of stockholders now is 69,427 compared with 71,382 in the second quarter and 70,009 in the first one. In the third quarter in 1923 there were 68,281 enrolled.

Reo Plans Displays at Overseas Shows

LANSING, Sept. 23—Reo Motor Car Co. is arranging for active participation in all leading foreign automobile shows to be held during the latter part of this year and the early part of next. Working with its representatives it will stage showings of the complete Reo line as adapted for use in the particular countries in which each show is held.

The first show in which the company will be an active participant will be the Olympic show in London, in October, following which it will exhibit at the Glasgow show, set for November. The two big shows in South America, at Rio Janeiro in October and Buenos Aires in November, will also find the company actively working with its distributors at these places to make the Reo line outstanding features.

Other shows in which the company will be strongly represented are the Brussels exhibition and the Eastern Australian show at Sydney.

Since the start of its intensive cultivation of the foreign markets about a year ago, the company has gained a strong position for its products in European, African and Australian fields, it declares. The European field is now getting a large measure of attention, and the company reports agencies established in many important cities.

Export business has grown greatly since the first of the year.

DITZLER COLOR ELECTION

DETROIT, Sept. 22—Directors of the Ditzler Color Co., automotive painting materials, have elected the following officers: T. W. O'Connor, chairman of the board; E. R. Hoag, president; William T. Utley, vice-president and treasurer, and Kirke W. Connor, secretary.